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\*Illustrated.

The Interstate Commerce Commission has become one of the most important branches of the federal government. Congress

### The Housing of the Commission

has imposed numerous important duties on it and is constantly giving it new ones. Its work affects the material welfare of the people more than that of any other public body except Congress and the Supreme Court. And yet, in some respects, Congress has been so shortsighted and niggardly in dealing with the commission as greatly to interfere with its efficiency. A glaring example is the persistent failure and refusal of Congress to provide the commission with proper office accommodations. It long since outgrew its original offices, and its various departments and bureaus are today dispersed through five different buildings in the city of Washington. Furthermore, its members and its staff who have offices in the Interstate building and the American National

Bank building, which are directly connected, are packed in like sardines in a box. With its quarters thus crowded and its organization thus dispersed the difficulties encountered in doing its work efficiently are far greater than they need be. The commission repeatedly has asked Congress to provide for the erection of a suitable building for it or to let it lease one for a reasonably long term. But, while Congress can find the money with which to build \$100,000 postoffice buildings in \$10 county seat towns all over the United States, it has not been able to persuade itself to provide properly for the housing of this important branch of the government. The way in which the commission has been treated in this regard is discreditable to Congress and the nation, and ought to be changed at the earliest possible date.

The Oregon-Washington Railroad & Navigation Company in defending the suit of one Chadwick, in an Oregon court, has se-

### Train Rules in Court

secured a judicial decision sustaining the binding force of the company's train rules, even, apparently, in the face of careless non-enforcement; the decision being to the effect that the rules "establish the standard by which care is determined; and, though custom may interpret the rules, it cannot contradict them." This is, of course, the only logical view. But, though a bad custom cannot destroy a good rule, it can defy the good superintendent who does not enforce his rule. Again, innumerable situations will arise where a conductor or brakeman must use his best judgment as to whether he is or is not obeying a given rule. Take the flagging rule, for instance. To wait sixty seconds, or two minutes, or longer, before starting back may be disobedience to the rule, or it may be an interpretation of it. But, whatever the difficulties, the responsibility is always resting on the individual employee to take good care that he is not going contrary to the requirement of the rule. In other words, the employee must always be supposed to possess and exercise judgment and discretion; and also to have a conscience. Without these no train rules can be carried out successfully. Train-running is too complicated a business to be subjected to rules, like those of the shoveler, or the water carrier, which so fully fit the case as to need no interpretation. In actual, every-day practice this court decision does not help us much. The employee who claims that, in a given case, he has been justified in acting contrary to a rule, because infractions have been constantly winked at, may be expected to put up a strong fight; and unless the officer's position is impregnable he is likely to surrender—either at once or after a brief and feeble defense. Moral: Don't depend on the court for stiffening of rules; punish rule-breaking at sight.

The advocates of the standard box car will find food for thought in the article by R. W. Burnett, general master car builder of

### Design and Construction of a Standard Box Car

the Canadian Pacific, which appears elsewhere in this issue. Mr. Burnett says plainly that he is not in favor of a standard box car, and it is refreshing to read such a "straight from the shoulder" argument as is given in this article. His statement regarding the cost of the present-day repair bills had a standard box car been adopted ten or fifteen years ago is worthy of attention, and it may be pertinent to consider this also from the standpoint of loss and damage claims. The standard box car, it will be remembered, was first suggested by the American Railway Association, which in November, 1912, and again in May, 1914, passed a resolution requesting the Master Car Builders' Association to design and adopt a standard frame for closed cars in accordance with the present standard inside dimensions of box cars. In May, 1914, the Executive Committee of the American Railway Association appointed a special committee, of which E. P. Ripley, president of the Atchison, Topeka & Santa Fe, is chairman, to consider the subject of standard freight car equipment. This

committee has appointed a sub-committee with George L. Wall, of the Lima Locomotive Corporation, as chairman, the other four members being representatives of car-building companies. It is understood that the Master Car Builders' committee on Car Construction and Car Trucks are working up designs of a standard car, in accordance with the American Railway Association resolution, which will be presented to the association for consideration at the next convention.

#### LIMITING THE LENGTH OF TRAINS

THE *Railway Age Gazette* has often commented on the fact that while shippers frequently have made organized efforts to get reductions or prevent advances in rates, they seldom have made organized efforts to prevent action which would increase railway expenses, although such action directly tends to cause raises in rates. All over the country railway employees and politicians have been getting passed train crew laws and similar legislation. Although such legislation directly concerns everybody who pays railway rates or uses railway service, the Farmers' Union and the Commercial Club Secretaries' Association of Texas have been almost the only bodies of shippers making representations to their legislatures against it.

But shippers elsewhere are awakening to which side their bread is buttered on. A bill to limit the length of freight trains to a half-mile has been introduced in Indiana. The Indiana Grain Dealers' Association and the Indiana Millers' Association are opposing it. In a public statement Charles B. Riley, secretary of these organizations, announces that 600 firms have petitioned the legislature not to pass the bill. Mr. Riley says: "The greatest embarrassment to shippers in the past has been due to failure of the carriers to supply adequate equipment with which to move the tonnage. But now that the size of locomotives and cars has been increased, and grades and curves removed, 100 or more loaded cars can be hauled with greater ease, safety and celerity than formerly prevailed in handling 50 cars. The public which has to cross railroad tracks should favor the largest possible unit for freight trains since the hazard connected with operating a large number of trains is reduced correspondingly with a reduction of trains."

These sentences indicate two strong arguments against train limit laws. The so-called "car shortages" of the past have been shortages of all kinds of facilities. Many roads have had enough cars, but not enough engines to move them. Train limit legislation, by restricting the number of cars hauled by each engine, would aggravate the effects of a shortage of locomotives. One of the arguments made against long trains is that they sometimes block the streets of towns. But a train of 25 cars may block a street as effectually as a train of 100 cars; and the shorter and, therefore, more numerous trains are, the more frequently will highways be blocked by them.

The two strongest arguments against train limit legislation are, that it will increase both railway expenses and railway accidents. It will do so for the following reasons:

1. The railways have bought at increased cost locomotives of an increased tractive power. If the law prevents these locomotives from hauling as many cars as they can the investment in the unused part of their tractive power will be rendered valueless and at the same time the roads will be forced to buy more locomotives.

2. The railways have spent large sums to reduce grades and curvature and build longer passing tracks, to enable them to haul longer trains. They expected the saving they would make in operating expenses by hauling longer trains to exceed the addition to fixed charges which would be caused by the investment made in reducing grades and curves and building longer passing tracks. If they are prohibited from hauling long trains the entire investment made for these purposes will be rendered valueless, while the fixed charges on the investment will still have to be paid.

3. By reducing the length of trains and thereby increasing the number of trains that must be run the proposed legislation would

make necessary a proportionate increase in the fuel consumed and in the number of engineers, firemen, conductors, trainmen and all other employees directly and indirectly connected with train operation. Every cent of the additional expenditure for fuel and wages thus caused would be absolutely wasted.

4. Other things being equal, an increase in the number of trains run increases the number of accidents. To prevent an increase in accidents resulting it is necessary to build additional trackage, install additional signals and make other investments in additional facilities. But if these additional investments be made the prevention of an increase in accidents will be secured at the price of an increase in operating expenses and fixed charges all along the line.

It is superfluous to say that it is against the interests of those who use the service of railways to have the hazards of their operation increased. It is superfluous to say it is against the interests of those who pay railway rates to have their fixed charges and operating expenses unnecessarily increased. Within recent years many railway measures which have been entirely indefensible from the standpoints of both economics and safety have been introduced in the state legislatures and in Congress. Among all these measures there has not been one which has been so utterly incapable of being advocated on any rational pretext as the train limit bills. How self-respecting and intelligent railway employees can permit the legislative representatives of their brotherhoods to ask for such legislation we cannot understand. How any lawmaker with a ray of intelligence or a particle of self-respect or public spirit can vote for it we cannot understand. The grain dealers and millers of Indiana are amply justified in opposing it. It ought to be opposed by the traveling public and by all classes of the shipping public. The greatest factor which has enabled the railways of the United States to haul freight cheaper than any other railways in the world, while paying the highest wages in the world, has been their success in increasing their freight train loads. To limit the size of their train loads would be to strike the most deadly blow possible at the efficiency and economy of their operation.

#### THANK YOU FOR THE COMPLIMENTS!

OUR thanks to Warren S. Stone, grand chief of the Brotherhood of Locomotive Engineers! After reading some of the compliments he paid to the *Railway Age Gazette* at the hearing in the arbitration between the western railways and their engineers and firemen, we are reminded of the old story of the Southern dinky who was asked by a Northern white man to change a ten-dollar bill. "I can't change no ten-dollar bill, boss," said the dinky, "but I thanks you for the compliment."

A. W. Trenholm, chairman of the Conference Committee of Managers, was on the witness stand on February 24. Mr. Stone was questioning him. Thereupon the following colloquy took place, the italics used being our own:

"Mr. Stone: For example, the *Railway Age Gazette*, which is the official organ of the railways and speaks for them—

"Mr. Trenholm: Is that right? Have they got the authority to speak for the railroads?

"Mr. Stone: They generally do, anyway.

"Mr. Trenholm: They haven't mine.

"Mr. Stone: The *Railway Age Gazette* of July 24, 1914—

"Mr. Nagel: Did you want to answer that last statement?

"Mr. Trenholm: They do not have the authority to speak for the railroad I am connected with.

"Mr. Stone: *But they do quote about all the authorities of the different railway experts on all the different subjects and questions that come up, do they not?*

"Mr. Trenholm: They invite from railroad officials and mechanical people communications on different subjects and publish them; and when I write an article and sign it, they are authorized to speak for me, but when I do not, they are not.

"Mr. Stone: And they do have first hand information in regard to all railroad information, and details, long before any other publication is given them, do they not?

"Mr. Trenholm: Not so far as I know.

"Mr. Stone: *Is it not a fact that anything new, strange or startling that happens to any railroad is first seen in the *Railway Age Gazette*?*

"Mr. Trenholm: Well, I think they make a specialty of trying to treat



with those matters, locomotives, and all things of that kind. That is the business of the paper. But so far as having any inside track is concerned, I do not know anything about it.

"Mr. Stone: Then, perhaps, taking it for granted they have not any inside track, how do they always get this information before any other publication does?"

"Mr. Trenholm: Well, I do not know their methods. I have had many communications from them asking questions, and some I have answered and some I have not."

Modesty compels us to say that Mr. Stone was partly wrong in his references to this paper. The *Railway Age Gazette* is not "the official organ of the railways" and does not "speak for them." The *Railway Age Gazette* is published by a private corporation, not one dollar of whose securities is owned by any railway company or railway man, and it expresses the views of its editors and of nobody else on earth. Usually its views coincide with those of railway men, but often they do not; and it always says what it thinks regardless of what they think. If it were the "official organ of the railways" many things which have been said in these columns about grafting, high finance and accidents, for example, would never have been said. We thank Mr. Trenholm for having set Mr. Stone right. We haven't Mr. Trenholm's or any other railway man's authority to speak for him, and we haven't any railway company's authority to speak for it. The railways are our patrons, just as the railway supply concerns are. That is the only relation we have to either of them; and we get a lot more business from supply concerns than from railways.

Continuing his questions, Mr. Stone implied that the *Railway Age Gazette* "quotes about all the authorities of the different railway experts on all the different subjects and questions that come up"; that "anything new, strange or startling that happens to any railroad is first seen in the *Railway Age Gazette*"; and that this paper "always gets this information before any other publication does." Here Mr. Stone was on firmer ground. We are unable to deny these various soft impeachments. Blushingly we admit them all. They show that Mr. Stone is one of our diligent and well-informed readers. We regret that in spite of his frank and flattering recognition of our leadership in our field he does not always accept our views, especially those occasionally expressed regarding the Brotherhood of Locomotive Engineers and its distinguished grand chief. But the fact that these little differences of opinion do arise make us appreciate Mr. Stone's good opinion all the more.

It is evident, however, that in his colloquy with Mr. Trenholm Mr. Stone did not get all the information he wanted. He showed an earnest desire to learn why it is that "anything new, strange or startling" that happens in the railway world is "first seen in the *Railway Age Gazette*," and how it "always gets this information before any other publication does." He seemed to think this must be because the *Railway Age Gazette* has some intimate underground connection with the railways. The truth is much simpler than that. The *Railway Age Gazette's* success in "always getting information before any other publication" is due solely to the fact that it has a large editorial staff; in fact, the largest editorial staff of any technical journal in the world, a majority of whose members have had experience in railway service; and that its editors are always on the job. And being on the job does not mean being at their desks. It means being wherever there is an important railway convention, arbitration hearing or rate case to report, or a new locomotive or a piece of new railway construction to describe. In the year 1914 one of our editors traveled 19,000 miles on 11 railways in this country and 8 in Europe—and this was 11,000 miles less than his usual annual mileage on railways. In the same year another of our editors traveled 18,520 miles on 17 railways in this country. Another traveled 20,000 miles on 23 railways in this country and one in Canada. Another traveled over 8,000 miles on six roads; another 6,000 miles on 25 roads; another 5,500 miles on 18 roads, another 5,400 miles on 11

roads. Every mile of this traveling was done for the purpose of getting editorial material for the *Railway Age Gazette*; and every mile was paid for in hard cash.

If information doesn't come to our editors they go and get it. And this, we confide to Mr. Stone, is the sole secret of the success of this paper in getting railway information ahead of other publications. We will confide something else to him. This is that, contrary to his impression, we do not *always* get information before any other publication does. But in saying that we do, he was very close to the exact truth; and we have no disposition to pick a quarrel with him for having very slightly exaggerated our efficiency!

#### ECONOMICAL RETAINING WALLS

THE justification for the use of retaining walls of the common mass or reinforced concrete design was seriously called in question in the discussion at the meeting of the Western Society of Engineers last Monday night following the reading of the paper on "Retaining Walls on Soft Foundations," abstracted elsewhere in this issue. As was well emphasized in a written discussion by Onward Bates, such walls are very expensive in comparison with other methods successfully used for retaining material, notably the tie cribs frequently built along operated tracks to prevent the flowing of filled material, and the plank cribbing commonly found in coal yards to retain the stored coal.

In the Rock Island track elevation work now under way at Chicago the mass retaining walls 30 ft. high cost about \$115 per lineal foot, while cribs of old ties used to protect the operated track were built at a cost of \$0.20 per lineal foot. Retaining walls on this work 18 ft. high, which is a common standard for track elevation projects, cost \$31.82 per lineal foot, being supported on spread foundations. It must, of course, be remembered that the cribs were only temporary, and they were not advocated as a substitute for mass walls by engineers who have given the subject the most study. However, walls made by cribbing up reinforced concrete members of about the same size as track ties have given satisfactory service on several roads, and on the Chicago & Western Indiana the cost of such walls from 7 to 8 feet high is stated to be from 14 to 17 per cent of that for a mass wall for the same location. This indicates that at least for low walls the crib design retains its economic advantages when built of a permanent material. Further study along this line would be profitable if only to determine the limits within which such a crib wall is advantageous.

Another point suggested in Mr. Bates' comments on the paper is the possibility of utilizing the wall section to better advantage than is done in common mass design, the so-called cellular wall developed by the Chicago, Milwaukee & St. Paul for the track elevation at Milwaukee being an example of this possibility. He showed that in the ordinary walls, if piles are used to support the toe they can rarely ever be placed in sufficient numbers where they are needed, and in all cases a large mass of concrete is placed in the footings for the sole purpose of preventing the top of the wall from tipping or sliding out of place. Comparisons of the symmetrical cellular type illustrated in Mr. Lacher's paper and a typical mass design for a fill 17 ft. high, show a lower sectional area for the former in all cases, this area being less than half for two of the three cases considered where the wall was assumed to be 24 ft. 6 in. and 27 ft. 6 in., respectively, from the center of the adjacent track. In this design the two face walls support each other by the tie walls connecting them, and even the poorest foundation material could support the weight of these walls as no pressure is carried down to their footings from the fill or the live load.

A similar design is being used on the Long Island end of the New York Connecting Railroad's approach to the Hell Gate bridge. In this case the walls are reinforced by 8-in., 16-lb. channels at 10-ft. intervals, vertically and horizontally, and 2¼-in. tie rods are provided at each intersection. Concrete cross walls are spaced about 70 ft. apart, and the fill is placed in each of these sections in thin convex layers carefully rammed so as

practically to eliminate horizontal pressure on the walls. The extreme height of these walls, 72 ft. in the maximum, made this unusual precaution advisable.

The discussion showed a general opinion that too much has been spent for some retaining walls and that possibly a part of the excessive cost is caused by trying to design a wall in which there will never be the slightest movement. The tendency in the face of increasing land values and increasing traffic on the railways is of course to build all structures with greater consideration of permanence, and this tendency is probably justified in many cases. It is worth considering, however, if too much is not being paid for the degree of permanence secured in some retaining walls. A careful analysis of the costs and the advantages and disadvantages of the various types for the particular conditions surrounding the Milwaukee track elevation work is included in Mr. Lacher's paper. The same conclusions might not be reached, however, under different conditions, and a careful study of the requirements for any particular retaining wall and all the possible methods of meeting them will be well repaid by the lower annual charge on the work.

### FUEL COSTS AND TRAIN LOADING

**I**N the endeavor to effect economies in railway operation, attention naturally has first been directed to the larger classes of expenditures, any reductions in which have correspondingly great effects on the total. One of the items entering prominently into the cost of railway operation is the cost of fuel. The report of the Interstate Commerce Commission for the year ending June 30, 1912, shows that practically \$225,000,000 or 11.83 per cent of all operating expenses was expended for fuel. This is two-thirds of the amount spent for wages of yard and road engineers and trainmen. In seeking to promote improvement in this field the problem divides itself immediately into two sections, each of which must be treated separately. The education of the firemen and engineers in the proper use of fuel is now receiving a great deal of attention and the results secured along this line on the Chicago, Burlington & Quincy, the Chicago Great Western and other roads, have been related in these columns.

Mr. Price emphasizes the importance of the second division of this problem in his article in another column. The conservation of fuel by using it in such a manner as to secure the greatest amount of productive work from it, is a problem which depends for its successful solution upon the chief dispatcher, the trainmaster, the superintendent and other men having supervision over train loading as well as on the engine crew, and the best endeavor to conserve fuel on the part of the engineers will not overcome the results of inefficient train loading. The economy of handling tonnage trains is fairly well realized in the abstract. However, it is not as well realized from the standpoint of its effect on fuel supply.

When the tonnage rating on a division is increased it very frequently meets with the open opposition of the train and engine crews as well as of the traveling engineers and trainmasters. However, if they can be shown that in many cases these increases are made with the use of a relatively small increase in the amount of fuel burned the opposition will be at least partially overcome. This condition was illustrated in a striking manner by the experience of one western road during the past year. Becoming convinced that the tonnage rating for certain classes of engines was too low, the general superintendent ordered that it be increased 100 tons. He at once encountered the active opposition of the traveling engineers particularly. After a couple of months, however, these men saw that the number of ton-miles handled per unit of fuel consumed showed an increase, resulting to the credit of their division in comparison with other divisions on the system. Their attitude was immediately changed and the general superintendent now has their hearty co-operation in raising the ratings still higher. Thus in the endeavor to secure the greatest amount of work from each unit of fuel the entire responsibility for improvement does not lie with the engineer and the fireman, but the superintendent and his staff as well can afford to give this subject their careful attention.

### PENNSYLVANIA RAILROAD

**I**T would appear that the Pennsylvania Railroad in the calendar year 1914 carried out the first experiment on a very large scale in the history American railroading of a comprehensive scientific reduction in operating expenses commensurate with a reduction in both freight and passenger traffic without extending the policy of cutting down expenses to maintenance of way. The experiment was successful within the limits in which it was carried in 1914. It could not have been carried out successfully, probably, by the majority of the other large railroad companies in the country, nor can it be, probably, extended even by the Pennsylvania very much further to meet a continued falling off in traffic.

The calendar year 1914 was a black cloud for the eastern railroads without a vestige of silver lining. The total operating revenues of the Pennsylvania Railroad were \$187,252,000, a decrease of \$17,828,000 from the 1913 total.\* Railway operating income in 1914 amounted to \$35,259,000, or \$3,983,000 less than in 1913. Freight traffic, measured in ton-miles, fell off 11.67 per cent, and passenger traffic measured in passenger miles, 4.31 per cent. Transportation expenses amounted to \$72,234,000, a decrease of \$6,021,000, or 8.34 per cent; maintenance of equipment expenses amounted to \$37,144,000, a decrease of \$5,841,000, or 15.73 per cent; while maintenance of way amounted to \$25,020,000, a decrease of \$1,315,000, or 5.26 per cent. If maintenance of way had been cut in the same proportion as transportation expenses and maintenance of equipment expenses, there would have been little loss in railway operating income for 1914 as compared with 1913. It will be seen that transportation expenses were reduced in proportion to the loss in business and this reduction was effected by a reduction in train mileage. With the ton mileage smaller by 11.67 per cent, freight train mileage was reduced 13.87 per cent; with the passenger mileage smaller by 4.31 per cent, passenger train mileage was reduced 4.73 per cent. The approximate reduction in number of employees in 1914 as compared with 1913 was 8 per cent.

The reasons why the Pennsylvania could cut its transportation and maintenance of equipment expenses proportionately to the loss in business, while the majority of other roads and the Pennsylvania itself have never succeeded in doing this before, are many and somewhat complicated; but there are two fundamental reasons which are capable of explanation. On the one hand, traffic density, both freight and passenger, on the Pennsylvania is so heavy, necessitating such frequent train service, that with a falling off in business, trains can be taken off in proportion to the loss in business up to a certain definite limit. In 1914 this limit had not been reached. The other reason was a composite one, made up of the strength of the company's credit, the confidence of the security holders in the management, the identity between the final authority and the active management, the Pennsylvania's form of organization which in matters of policy so centralizes and concentrates authority, and the spirit in which the situation which confronted the company at the beginning of the year was met.

The Pennsylvania Railroad operates 4,512 miles of road. In 1913, the year of greatest business in the history of the company, the system handled 25,025,000,000 ton-miles and 2,108,000,000 passenger miles. Thus the freight density (ton-miles per mile of road) in 1913 was 5,587,000, and passenger density (passenger miles per mile of road), 471,000. While, of course, the total capacity of the plant, exclusive of terminals, was not reached even in 1913, so great a percentage of its total capacity was then in use that the vast majority of freight traffic was handled in trains given their full rating of tonnage, and but a very small part of the freight business was handled in light trains, run because the traffic could not wait for a full train tonnage.

With a reduction of a little less than 12 per cent in ton mileage, the total ton mileage in 1914 amounted to 22,104,000,000, and the freight density to 4,899,000. Of the total 135,296,000

\* Throughout these comments the combined figures of the Pennsylvania Railroad and the Northern Central for both 1914 and 1913 are used, the Pennsylvania having taken over the Northern Central as of July 1, 1914, and added it to the Erie division to form the Central division.



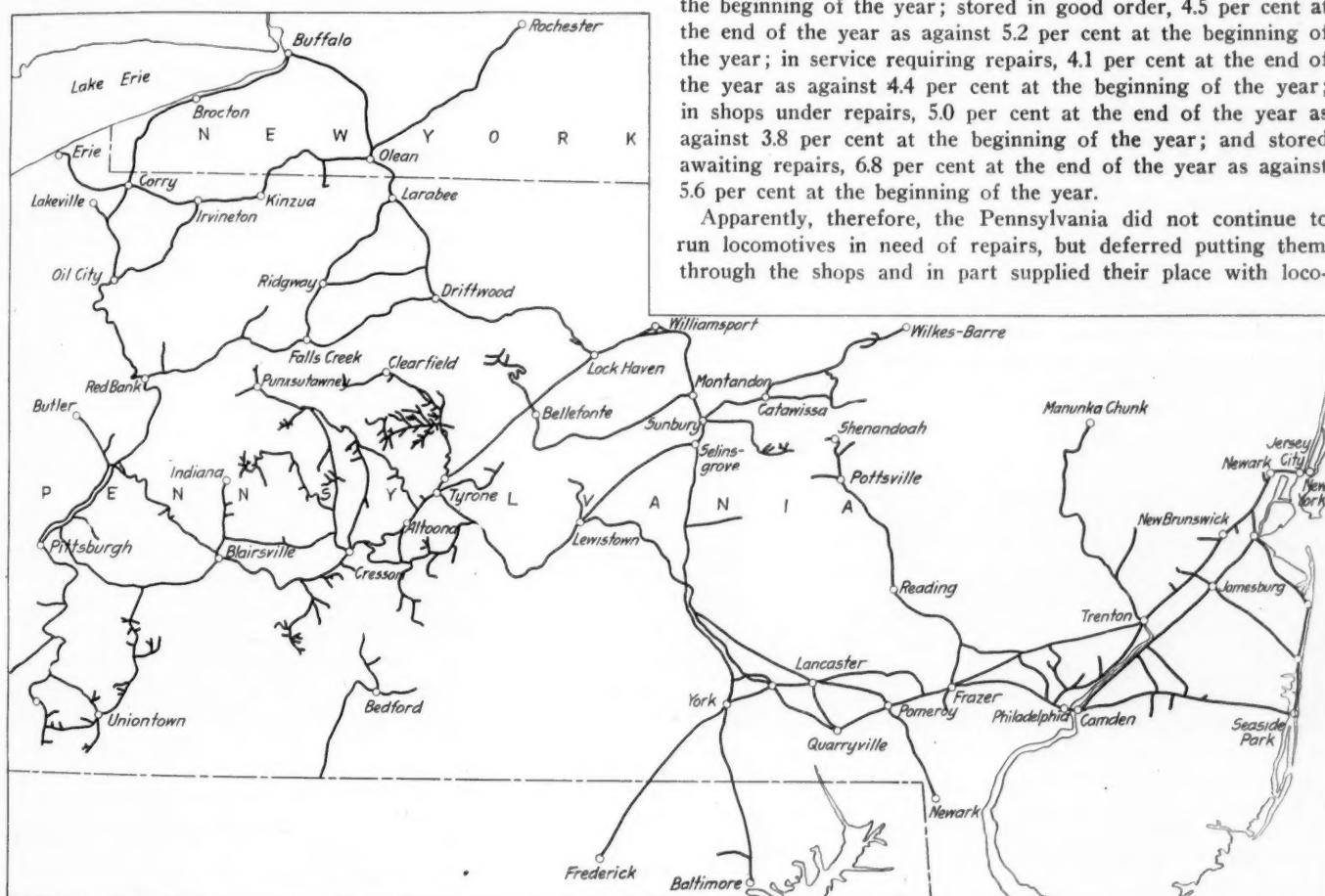
tons carried on the Pennsylvania in 1914, 69,962,000 tons, or more than half, was coal and coke. The total tonnage of all commodities in 1914 was less by 19,913,000 than in 1913. The tonnage of anthracite coal was slightly larger in 1914 than in 1913; but the total net falling off in coal and coke tonnage amounted to about 8,300,000 tons, and the decrease in tonnage of iron and of castings and machinery amounted to another 2,982,000 tons, so that out of the total loss of 19,913,000 tons, 11,282,000 tons was in tonnage which moved almost exclusively in drag freight trains. To meet the loss in this tonnage it was simply necessary to run fewer drag freight trains. As a matter of fact, with the large loss in tonnage and the large proportion of that loss in low grade freight, the Pennsylvania Railroad's average revenue freight train load in 1914 was 722 tons, an increase of 18 tons over the previous year. It would be hard to conceive of more striking testimony to the success of the Pennsylvania operating officers' work in 1914.

The Pennsylvania allocates its expenses as between freight and passenger, and although the allocation is made on an ar-

net loss in the year 1914 per passenger train mile of 9 mills as compared with a net revenue in the year 1913 of 4.1 cents.

Besides the reduction in transportation expenses there was a reduction in the amount spent for maintenance of equipment of \$5,841,000, the total in 1914 being \$37,144,000. This is deferred maintenance, in the sense that the cost of repairs which were needed in 1914 and not made will have to be paid for out of earnings of some other year; but unlike deferred maintenance of way expenses, they will not have to be paid for twice. The distinction is important in the case of the Pennsylvania, although under other circumstances it might be just as much of a false economy to defer expenditures on maintenance of equipment as on maintenance of way. What happened in the Pennsylvania case is shown by the following figures: Total locomotive mileage in 1914 amounted to 103,006,000, a decrease of 13,345,000, or 13 per cent; freight car mileage amounted to 1,268,000,000, a decrease of 149,000,000, or 10.5 per cent. The percentage of locomotives in service in good working order at the end of 1914 was 73.6 per cent, exactly the same percentage as at the beginning of the year; stored in good order, 4.5 per cent at the end of the year as against 5.2 per cent at the beginning of the year; in service requiring repairs, 4.1 per cent at the end of the year as against 4.4 per cent at the beginning of the year; in shops under repairs, 5.0 per cent at the end of the year as against 3.8 per cent at the beginning of the year; and stored awaiting repairs, 6.8 per cent at the end of the year as against 5.6 per cent at the beginning of the year.

Apparently, therefore, the Pennsylvania did not continue to run locomotives in need of repairs, but deferred putting them through the shops and in part supplied their place with loco-



Pennsylvania Railroad

bitrary basis, the figures arrived at are accurate for comparative purposes. The freight train revenue per train mile in 1914 was \$4.25, an increase of \$0.144. Expenses per train mile amounted to \$3.135, an increase of \$0.076, so that net per train mile was \$1.115, an increase of \$0.068.

In cutting off passenger train mileage the management was almost as successful as in freight train mileage; but probably largely because of the operation of the full-crew law during all of 1914, the increase in passenger train expenses per train mile offset the economies made through a reduction in train mileage. The total number of passengers carried one mile in 1914 was 2,017,000,000, a decrease as compared with 1913 of 91,000,000. The average revenue per passenger train mile in 1914 was \$1.60, an increase of \$0.021. The expenses per train mile in 1914 were \$1.609, an increase of \$0.071. There was, therefore,

motives which had been repaired in previous years and were stored in good order. Of course deferring maintenance expenses in this way, if there was any prospect of a large and sudden increase in business, would be poor economy. Repairs could be more cheaply made in slack times, but there is no present prospect for a sudden large increase in business on the Pennsylvania. The deferring of repairs, therefore, is not a grossly false economy. When the repairs to the equipment are made, present prospects are that they will cost little, if any, more to make than they would have in 1914.

Deferring maintenance of way, however, on a road like the Pennsylvania is an entirely different matter. A falling off in train mileage of 10 per cent. decreases the actual cost of maintenance of way, if the same standard is to be maintained on the Pennsylvania, by only 2 or 3 per cent. If, however, track is

allowed to deteriorate from standard, the expenditures necessary to bring it back, maybe 2 to 3 or 4 times as great, to those that would have been necessary to maintain it at standard.

The Pennsylvania executive officers are not the only railroad men in America who believe these principles are a fact beyond dispute; but the peculiar situation in regard to the strength of the company's credit and final authority being vested in the management has given the Pennsylvania officers an opportunity to live up to what they believe, where the great majority of other railroad officers have not been so fortunately placed. In 1913 the Pennsylvania spent the largest amount for maintenance of way in any year in its history and its appropriations were generously ample. In 1914 there was \$25,020,000 spent on maintenance of way, or only \$1,315,000, 5.26 per cent. less than in 1913.

Toward the latter part of 1913 it had become unmistakably plain that there would be a very heavy decrease in traffic in 1914. The Pennsylvania management, after probably very careful deliberation, decided on the policy of economy without arbitrary reduction in allowance for maintenance or any other expenses which was later carried out. The operating officers had the situation explained to them very fully. Any reduction in maintenance of way expenses had to be justified as carefully as an increase in expenses would have to be justified. No reduction of any class of expenses was to be made in such a way as might prove uneconomical in the long run. In other words, so far from sending out orders that shop forces must be cut, section men laid off, etc., headquarters put it up to the operating officers not to make reductions in expenses that would prove false economies.

In 1914 the Pennsylvania spent \$14,486,000 for additions and betterments. The most important construction work now in progress is summarized in the construction news columns of this issue, and it is only necessary to mention here that the electrification of the main line is proceeding without interruption; that the telegraph and telephone wires between Broad street station and Paoli, Pa., and Jersey City to Rahway, N. J., have been completely placed underground, and the work of placing wires underground between New York and Philadelphia is being carried out.

During 1914 the Pennsylvania sold no securities, but since the close of the year has sold \$49,000,000 of its consolidated mortgage 4½ per cent. bonds, which sale makes the consolidated mortgage practically a closed one, almost the entire \$100,000,000 bonds which can be issued under it being outstanding. There are \$86,827,000 convertible bonds due October 1, 1915. Stockholders had already authorized the issue of \$31,000,000 additional securities and at the annual meeting on Monday last authorized an additional issue of \$40,000,000, making a total of \$71,000,000 securities which may be issued to refund that portion of the \$86,827,000 maturing October 1 not provided for by the sale of the \$49,000,000 consolidated mortgage bonds and for any other purpose.

The Pennsylvania had on hand December 31 (before the sale of the consolidated mortgage bonds, of course) \$15,587,000 cash and \$18,648,000 time drafts and deposits. There were \$5,110,000 loans and bills payable.

The table shows the principal figures for 1914 and 1913:

	1914	1913
Average mileage operated.....	4,512	4,512
Freight revenue .....	\$131,158,930	\$147,317,395
Passenger revenue .....	38,977,848	40,599,628
Total operating revenue.....	187,251,851	205,080,112
Maint. of way and structures, ..	25,019,605	26,334,595
Maint. of equipment.....	37,143,533	42,984,269
Traffic expenses .....	2,316,127	2,847,024
Transportation expenses .....	72,234,108	78,255,026
Miscellaneous .....	2,624,137	2,653,376
General expenses .....	4,954,732	4,923,127
Total operating expenses.....	141,292,243	154,997,418
Taxes .....	7,689,523	7,840,853
Net operating income*.....	35,258,772	39,241,841
Gross corporate income.....	51,792,223	57,712,898
Net income .....	34,090,765	41,920,833
Sinking and reserve funds.....	1,785,243	1,882,775
Dividends .....	29,952,186	28,394,248
Income appropriated for additions and betterments .....	2,230,336	6,787,583
Held in reserve.....		2,500,000
Surplus .....	123,000	540,602

\*The figures down to and including net operating income are for the combined properties—the Pennsylvania Railroad and the Northern Central—for both years. The figures below are for the Pennsylvania Railroad, and the Northern Central in the last half of 1914, for 1914. There is not, however, any serious discrepancy in the comparison, because previous to July 1, 1914, the Northern Central paid dividends to the Pennsylvania and its dividends were guaranteed by the Pennsylvania.

## Letters to the Editor

### CHEMICAL SPECIFICATIONS FOR BRAKEBEAMS

FRANKLIN, Pa.

TO THE EDITOR OF THE RAILWAY AGE GAZETTE:

In a letter on this subject, published in the *Railway Age Gazette*, November 20, 1914, page 940, I stated: "I know of one mill that is rolling sections for the solid type of beam from scrap steel axles."

\*I find that I was in error in making this statement, as I am informed that axles are not used for this purpose; therefore, not wishing to do an injustice, I retract the statement. There have, however, been thousands of brakebeams made, the members of which were rolled from scrap high carbon steel rails.

B. HASKELL, M.E.

### ARE THE COMMISSION'S CONFERENCE RULINGS LEGALLY BINDING?

HARRISON, Ark.

TO THE EDITOR OF THE RAILWAY AGE GAZETTE:

There are, no doubt, numerous railroad officials in all parts of the United States, whose early training and closely defined duties, have not made possible a satisfactory understanding of the various legal matters confronting the operating man of today.

For their benefit would it not be possible to briefly state through the columns of the *Railway Age Gazette* your views on the following:

Do, or do not, the Interstate Commerce Commission's conference rulings on the various acts to regulate commerce, have any judicial force or effect; or, in other words, considering the conference rulings in the light of working rules, would their violation invite the same penalties as obtains in connection with the Act to Regulate Commerce?

H. E. COCHRAN.

[It was our own opinion that the conference rulings of the commission had no binding legal effect and were not regarded by the commission itself as having such effect. We considered them merely interpretations of the law, disregard of which would bring punishment only if the courts should hold the rulings disregarded were correct interpretations of the law. However, we submitted our correspondent's question to George B. McGinty, secretary of the Interstate Commerce Commission, who has replied as follows: "This will acknowledge receipt of your letter of February 9, in which you ask to be advised whether the conference rulings of the commission have any judicial force or effect, and whether a deviation from a conference ruling is prohibited under the same penalties as are violations of the act to regulate commerce. As stated in the explanatory note published in Conference Ruling Bulletin No. 6, the conference rulings of the commission are simply expressions of the commission's views in connection with matters submitted informally to it, involving special facts or requiring interpretation and construction of the law. While these rulings are to be regarded as authoritative, and as precedents governing similar cases they do not have the force of formal orders entered by the commission under the authority conferred upon it by sections 13 and 15 of the Act to Regulate Commerce. There is no penalty provided for a violation of a conference ruling, as such, but obviously if a conference ruling is a correct interpretation or construction of the law, a deviation therefrom would necessarily involve an infraction of the law governing the particular matter to which the conference ruling relates. The penalty, if any, would be that attaching to the violation of the law." This statement from Mr. McGinty seems to cover the matter fully.—EDITOR.]



# Viaduct Construction on the Kansas City Terminal

## A Discussion of the Conditions Governing the Design of the Many Structures on This Important Project

By A. R. EITZEN

Office Engineer, Kansas City Terminal Railway

The construction work of the Kansas City Terminal included two distinct projects, the first, primarily for the benefit of the public, being the construction of a new union passenger station, and the second, to improve operating conditions, being the reduction of grades on all main line tracks east of the station and the elimination of the grade crossings over the entire system. A general description of the entire improvement at Kansas City was published in the *Railway Age Gazette* of May 23, 1913. The station which was recently completed was described in detail in the issue of October 30, 1914. A description of the design of the subways was published in the issue of December 13, 1912. The grade reduction and the grade elimination necessitated the building of 22,000 ft. of retaining walls, 21 viaducts and 12 subways, with approximately 181,000 cu. yd. of concrete and 8,500 tons of structural steel. A description of the general and detail designs of the viaducts in connection with this work is the purpose of this article.

The topography naturally divides the viaducts into two groups; the first comprising those which are isolated and which were designed independently of each other, as, for example, those crossing the tracks near the station; and the

Wherever shale beds in natural formation and resting on limestone were found, facing walls were used. Where earth was found, lightly reinforced gravity walls were built for heights of 25 ft. or less, while above that height buttressed walls were used. In many cases facing walls were constructed for a part of the height with gravity walls above. The retained bench tracks serve industries along the line and either pass under the viaducts through box abutments or, as in two cases, cross the streets at grade.

The first preliminary designs for these structures contemplated a series of three hinged, reinforced concrete arch spans with supplementary spans for the bench tracks, but a detailed study of the borings showed that this type was not feasible owing to the uncertainty of the foundations. The same design was therefore adopted for the spans over the tracks as in the first group, the face walls of the box abutments supporting the spans, while the back walls, together with wing or tail walls, supporting the earth slopes. The building of a coping across the front face of the abutments on a line with the copings of the retaining walls joining them gave the appearance of continuous walls with the bridges rising from them.

The first thing considered in the design of individual struc-



Broadway Viaduct at West Entrance to Station

second comprising those in the big cut east of the station which were connected by walls and necessarily had to be considered together to obtain a harmonious result. The general design of the viaducts in the first group was simple, the entire problem being to have approaches of sufficient length at the specified grade to obtain the standard clearance of 22 ft. over the tracks. The spans over the tracks are of an inverted through girder type of steel construction; that is, a type involving stringers, floor beams and main girders, but giving a smooth floor with no girders projecting above it. The approach spans have been built either of steel of the same type or of reinforced concrete, depending on local conditions. A clause in the franchise ordinance requires the structure to be of open construction to a point where 7 ft. minimum clearance is obtained. Beyond this point to the end the structure is made up of earth fill between reinforced concrete retaining walls.

In the second group the viaducts are all comparatively short, the street grade being from 20 to 80 ft. above the main line tracks. Continuous walls were built on both sides of the main line to retain the slopes and to support bench tracks. These walls vary in type in accordance with local conditions.

tures was their general appearance. The vast majority of people see or think little of the strength or construction of a bridge. They do usually notice, however, any obstructions of the roadway and sidewalks, the general outlines, and in addition the hand rails and lamp-posts. For this reason these points were given first consideration.

The grades for all structures were carefully studied with a view to securing an unobstructed roadway. In several instances the city was requested to allow changes of grade, which improved the connections with adjacent streets and at the same time allowed this type of construction to be used. The result was that out of 21 viaducts built, 16 have no projections above the street except hand rails and lamp-posts, 1 has trusses and 2 have girders along the curb separating the sidewalks from the roadway, while only 1 has a truss and another a girder in the center of the roadway in addition to those at the curbs. On the latter five structures, local conditions made it practically impossible to change the street grade or the grade of the tracks, the cost of the changes being far in excess of the additional cost of the through girder or through truss construction over the deck construction.

Special attention should, in this connection, be drawn to

the Pennsylvania avenue viaduct. Some question may be raised as to the advisability of designing deck plate girders with a span of 127 ft. 5 in. out to out, especially with a depth of only 9 ft. 8 in. from clearance line to top of pavement. However, it may be said that this structure is at the west throat of the station and that it was impracticable to shorten the span without badly disarranging a complicated track layout. Furthermore, Pennsylvania avenue will shortly become the chief artery connecting the north and south boulevard systems of the city, and the additional expense of keeping the roadway clear and unobstructed was considered justifiable. Ruling grades of 4 per cent were already being used on the approaches and local conditions controlled the length so that greater depth could not be obtained. This structure as well as all others had to be erected without disturbance of railway traffic and in a number of cases temporary structures for highway traffic were also provided.

The next point considered was the best appearance, con-

were kept smooth the location of bents had little effect.

The hand rails are of reinforced concrete unit construction and consist of posts 15 ft. to 20 ft. center to center, upper and lower rails, balusters and blocks. Dowels to anchor the hand rail posts were set when the floors of the viaduct were cast. The method of erection was as follows: First, small square blocks to support the ends and third points of the lower rails were placed; next, the lower rails were set in position; then the posts, which are hollow and also notched out for the rails, were set over them and all were accurately lined; the balusters and top rails were then placed in position; the posts filled with concrete to anchor them to the floor of the viaducts and the caps placed on the posts, the  $\frac{1}{8}$  in. joints left between balusters and rails and between rails and posts to give ease of erection were then carefully pointed. Expansion joints were left in one side of each post.

The lamp posts are of reinforced concrete surmounted by a single 100-watt lamp and 14 in. globe. They are arranged



Typical Structures Built in Connection with Wall Construction

sistent with economy and simplicity of design, of the structures from adjacent ones or from the back platform of trains passing under them. As a first consideration vertical curves of a length sufficient to give a smooth contour were used at all breaks in grade; second, a heavy coping of a depth sufficient to mask the ends of the sidewalk brackets, but not heavy enough to be out of harmony with the rest of the structure, was made continuous from one end of the structure to the other; third, all girders on any one structure were made of the same depth as far as practicable to preserve parallel lines for the top of the structure, the coping and the bottom line of girders. For those structures adjacent to the station, the divergence of the tracks made necessary the location of column bents at all angles. At first it was thought that this would seriously detract from the general appearance, but it was found that if the girder lines, which are mentioned above,

to be lighted by electricity but by removing the cables from the conduits and using a gas fixture and globe, gas may be used. A two-inch conduit is run in the curb on each side of the street to feed the lamps. At each post a pull box is inserted and a half-inch conduit carried from the pull box to the top of the post. Of course if gas is used the pipes must be connected through the pull boxes. A standard connection has been provided for this contingency. The lamp-posts are turned on a lathe, the method of manufacture being similar to that of making pottery. Lamp posts and hand rails have a sand finish, while the sidewalks have a float finish.

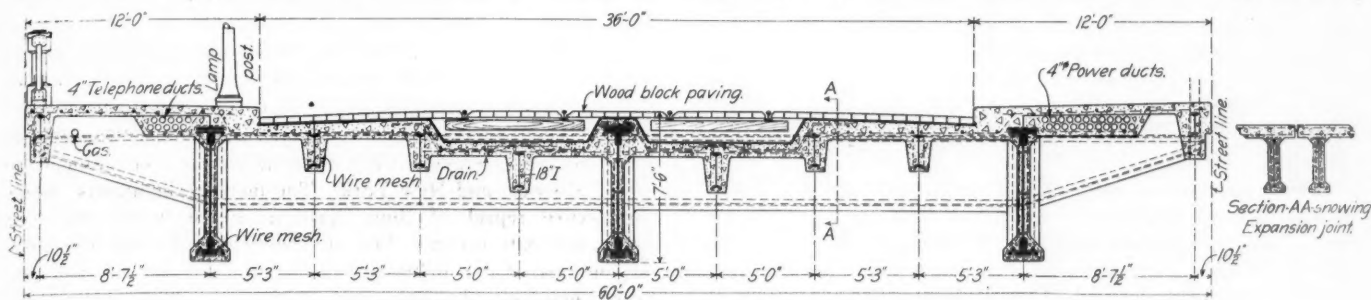
Provision was made for street car tracks on all structures as provided for in the franchise ordinance as well as conduits for the telephone and power companies and supports and protection for water and gas pipes. It may be mentioned in passing that proper provision for conduits and water and gas



pipes is one of the most difficult parts of the design of city bridges. The conduits used were of  $3\frac{1}{2}$ -in. fiber laid with a minimum of  $\frac{3}{4}$  in. of grout between ducts. The only difficulty experienced in their use was an inclination to float when the concrete was poured. This was prevented by setting pieces of wire in the green concrete of the slab supporting the ducts and using these to fasten pieces of reinforcing bars over the ducts before grouting them in. Inserts were built into the floor on the lines of the water and gas pipes to support hangers from which the gas pipes and the slabs protecting the water pipes will

oughly investigated and complete shop details conforming to the latest modern shop practice were drawn up.

The specifications used for design, materials and workmanship were identical with the American Railway Engineering Association specifications for steel railway bridges, except for loads and a few minor points of design. The loads used were the dead loads already mentioned, a live load of two 100,000-lb. street cars on each track, the distance between end axles of adjacent cars being 10 ft., truck spacing 30 ft. and axle spacing 5 ft., the cars being assumed to occupy 10 ft. in



Cross Section of Charlotte Street Viaduct Showing Typical Construction

be hung. The slabs supporting them are generally 2 ft.  $2\frac{1}{2}$  in. wide and reinforced with wire mesh. They will be built in units of about 5-ft. lengths and set in place on straps supported from hanger rods.

The viaduct span lengths were usually fixed by track conditions, although there was some latitude for some of the structures at the entrances to the station. The usual method of procedure adopted in the design was to first outline a tentative cross section so as to place conduits and pipes to the

width for each track; a uniform load of 100 lb. per sq. ft. on the roadway and 100 lb. per sq. ft. on the sidewalk. Impact allowance of 25 per cent was used for street car and roadway live loads. A 17-ton road roller was also used, assuming a spacing from center to center of axles of 10 ft. 9 in.; center to center of rear wheels, 5 ft.; load on front wheel, 11,000 lb., and load on each rear wheel, 11,500 lb. No allowance was made for impact on the roller, as this was assumed to be an occasional load. The distribution for road roller loads was



Erecting a 127 ft. 5 in. Girder at Pennsylvania Avenue

best advantage. Telephone and power cables were always placed on opposite sides of the structure. A detailed study of the arrangement was then made and the elevation of stringers adjusted so as to make the form work for the concrete floors as simple as possible, at the same time not losing sight of the fact that ease of erection of the steel work was very essential. These two points were very carefully watched throughout the work. From this it must not be inferred that design was neglected, for all elements of weakness were thor-

assumed to be over a length of 8 in. at the point of contact and spreading longitudinally at a rate such that at any depth "D" below the pavement, the distribution would equal 8 in. plus D. Laterally the distribution was assumed equal to the width of the rollers.

Various types of construction were tried, but with the loadings used the best results were obtained by spacing the main girders either 15 or 20 ft. apart, with floor beams at intervals of 14 to 20 ft., supporting lines of longitudinal string-

ers 5 ft. apart center to center. The stringers were framed to outstanding legs of stiffeners on the floor beams. On account of the general direction of the tracks with reference to the streets, all structures were skew, but all stringers were framed square with the floor beams and all floor beams and brackets square with the girders except the end floor beams. At expansion points two sidewalk brackets and two end floor beams were always provided, one on the end of each span. The ease with which the expansion could be taken care of, especially in the concrete encased spans and in the concrete encased fascia beams of the non-encased spans, more than offset any additional weight involved, besides making the structures present a much neater appearance. Expansion joints were made by casting a piece of 3-lb. sheet lead bent into a semi-fold into adjacent spans, as shown in the accompanying drawing. The loop thus formed was then poured full of asphaltic mastic.

The concrete encased spans mentioned above probably require a word of explanation. At the time the Terminal Railway took over the old Belt Line property, there were a number of viaducts over the tracks. Nearly all of these were in serious condition due to the corrosive action of blast and smoke. A few of the later structures were concrete encased and were in much better condition. It was decided that in order to insure a long life to the structures all spans over the tracks with a clearance of 25 feet or less should be concrete encased. This work is now being done with a cement



McGee Street Viaduct

gun. As an additional protection, blast boards 3 ft. 6 in. wide are being placed over all tracks to protect the concrete from the direct blast.

In the wrecking of several of the concrete encased spans it was noticed that water had percolated through the pavement, penetrated between the concrete encasement of the beams and the steel, and cracked and loosened the encasement. For this reason it was thought imperative that all floors should be waterproofed. The waterproofing consists of three-ply fabric, two of burlap with a layer of felt between. Each coat was mopped down with asphaltic material in addition to a priming coat for the concrete. The pavement was laid directly on the waterproofing without any cushion intervening. For all grades, up to and including 6 per cent, creosoted wood block laid with lath joints was used. For steeper grades, brick was used. Along each curb two expansion joints, 1 in. and  $\frac{1}{2}$  in., respectively, filled with asphaltic filler, take care of lateral expansion, although it was found desirable to add additional longitudinal joints in several cases. Transverse expansion joints are placed at all expansion joints in the structure. As an additional safeguard, all street drainage was kept away from the structures as much as possible, and the drainage from the structures was conducted to catch basins at short intervals.

The wall, viaduct and subway designs were all made under the direction of George E. Tebbetts, bridge engineer, under the supervision of John V. Hanna, chief engineer. The construction work was executed under contract.

## ANTI-FULL-CREW LAW CAMPAIGN

Samuel Rea, president of the Pennsylvania; Daniel Willard, president of the Baltimore & Ohio; Theodore Voorhees, president of the Philadelphia & Reading, and E. B. Thomas, president of the Lehigh Valley, have written letters to the stockholders of their respective companies, urging them to use their influence to have the full-crew law repealed.

R. L. O'Donnel, chairman of the committee representing the 21 associated roads of New Jersey and Pennsylvania, has issued a number of circulars during the past week dealing with certain local phases of the full-crew law question. To the people of a town where a new passenger station is needed, he observes that the \$2,000,000, which now is being paid yearly to trainmen whose services are unnecessary, would build two hundred new stations at an average cost of \$10,000 each. Mr. O'Donnel cites the stand taken against full-crew measures by the grangers of Texas, Missouri and New York. The farmers, he asserts, should help secure repeal of those laws in Pennsylvania and New Jersey, not only because they are fundamentally bad legislation, but "because of the higher prices for farm produce, making necessary increased plantings, and to meet the drawback of lack of labor." Farmers and business men of Kansas made such sharp protest that the bill which had been introduced in the legislature of that state was killed February 13 in the senate committee.

An effort to enact an excess crew law in West Virginia met with general opposition, and the bill was reported adversely by the legislative committee to which it was referred. In Alabama a legislative committee, after public hearings, concluded that the contentions of the trainmen's union were not well founded and that the measure would only compel employment of extra men not needed on the trains. The bill was consequently adversely reported.

In the state of Washington a bill has been agreed upon by committees of both the senate and the house, which in effect will repeal the full-crew law of that state and leave it to the Public Service Commission to say how the trains shall be manned.

Trainmen are trying to make the point that the railroads seek repeal of the laws in order to underman trains, even to the point of risking safety of passengers and reducing efficiency of operation. Nothing, says Mr. O'Donnel, could be further from the fact. "The best evidence that the railroads would not underman trains is afforded by what they are now doing. Thirteen railroads in Pennsylvania and New Jersey are operating 344 passenger and 446 freight trains manned in excess of what the law requires." He quotes Louis D. Brandeis, "best known of all critics of railroad affairs in the United States," who endorses the position taken by the railroads of Pennsylvania and New Jersey. In an interview at New York February 25 he says: "The railroads appear to me to have the better end of the full-crew argument. They seem to have made out a very good case. The full-crew laws are cumbersome and in an awkward way aim to accomplish something which a commission could do much better."

At last there promises to be a fair and open debate on the full crew question. Francis P. Boland, a brakeman of the Pennsylvania Railroad, who is also a member of the New Jersey legislature, sent a challenge to Mr. Rea, president of the Pennsylvania, asking that he, or such officers as he might designate, debate publicly the question how the law operates on the Pennsylvania in the State of New Jersey. Mr. Rea accepted, and the debate will take place at Elks' Hall, Jersey City, on the evening of Tuesday, March 9. Among several employees who asked the privilege of taking up the argument on the side of the company Mr. Rea has selected H. J. Fackenthall, an engineman who runs between New York and Philadelphia. Mr. Fackenthall has been prominent in the "safety first" work on the Pennsylvania, and is an experienced speaker.



## SOME MAXIMA AND MINIMA IN TRAIN OPERATION\*

BY ALFRED PRICE

Assistant General Manager, Canadian Pacific, Montreal

It has become a trite saying that a railway company has nothing to sell except transportation, but in order to sell its sole commodity it must have an ample supply available at all times, and to do so must buy a variety of materials.

During the past ten years almost every item it uses in construction and in the operation and maintenance of its property has increased in price. For example, steel rails, telegraph poles, car sills and lumber have increased by amounts varying from 29 to 54 per cent, while the wages of its enginemen, trainmen, yardmen, telegraphers and maintenance of way employees have increased from 19 to 79 per cent, an increase in all its purchases, including labor, of approximately 35 per cent.

If a commercial institution had to face the problem of securing sufficient additional revenue to offset such tremendously heavy increases in the cost of raw material and labor, it would adopt the simple and natural expediency of increasing the price of its product, so that the consumer would ultimately "pay the piper." But although a railway is a business conducted under much the same conditions as a manufactory, having many similar problems and difficulties, it does not enjoy the privilege of increasing its rates. In proof of this statement the following table, showing the earnings on all Canadian railways during the past seven years, is submitted:

Year	Passenger mile	Ton mile
1907.....	1.911 cents	.815 cents
1908.....	1.920 cents	.723 cents
1909.....	1.921 cents	.727 cents
1910.....	1.866 cents	.739 cents
1911.....	1.944 cents	.777 cents
1912.....	1.943 cents	.757 cents
1913.....	1.973 cents	.758 cents

Since 1907, therefore, the earnings per passenger per 100 miles show an increase of 6 cents, and per ton of freight per 100 miles a decrease of 5½ cents. But the ton mile units for 1913 were 23 billions, and the passenger mile units only three billions, so that the figures actually represent a very serious decrease in earnings. To be more specific, had the passenger mile and ton mile earnings of 1907 been applied to the 1913 traffic, the Canadian railways would have shown an increase in their net earnings of over \$11,000,000.

But, compared to a commercial enterprise, the railway has other handicaps; it cannot, like a manufactory, for instance, close down its plant in dull times and wait until there is a demand for its product, nor can it warehouse its product, holding for higher prices. The public demands that an ample supply of transportation be kept on hand at all times whether required or not; that the railway company be prepared to take care of the "peak load" whenever an unusual demand occurs, and that the service be efficient. These demands may, or may not, be reasonable, but in any event the railway company must comply with them. In view of these demands and the constantly increasing cost of everything the railway has to buy, and the stationary, or decreasing, cost of everything it has to sell, it is absolutely necessary that the strictest economy, consistent with efficiency, be practiced, and that intelligent, scientific methods of operation be adopted.

Unfortunately, the existing lines and facilities are not likely to be taxed to handle the traffic for some time to come. It would be folly, therefore, to advocate the lowering of transportation costs by reducing grades, eliminating curves, or building better operating facilities. Instead, it is desired to suggest that, under existing conditions, there are opportunities to reduce the operating expenses, for it will be freely admitted that there is a wide field for economy on the Canadian railways without any impairment of efficiency.

The operating official naturally desires to provide a service as satisfactory as can be reasonably expected by the public, and at the minimum cost. Efficiency and economy might well be adopted as his slogan. If he can handle the freight without damaging or losing it, he will take a long step towards efficiency, and, at the same time, will accomplish something worth while under the head of economy. Last year the Freight Loss and Damage account of the Canadian railways amounted to over \$2,000,000, a sum double the amount paid out in 1911. The shipper wants the goods delivered to the consignee intact, and would gladly waive the \$2,000,000 he now receives to have this done. This sum, therefore, may be regarded as a penalty imposed upon the railway for non-fulfilment of an obligation or contract. The railways are almost entirely responsible for this loss. The waste can be stopped by the adoption of up-to-date methods and insistence upon the exercise of greater care on the part of agents, billers, checkers, porters and trainmen.

For clearing wrecks and satisfying claimants on account of injuries the Canadian railways paid out last year over \$1,500,000. There were no less than 710 people killed by the movement of trains, besides 2,966 injured. It is quite true that almost half of those killed were trespassers, and we are likely to continue to have a harvest of deaths from this cause every year until there is a law making trespassing a very serious offense, and a severe penalty is imposed for a violation. Most of the other fatalities and injuries might have been avoided by the exercise of ordinary care.

The largest single operating item is the fuel bill. It amounted to \$28,000,000 last year on the Canadian railways. For every locomotive mile run there was consumed 113 lb. of coal for which was paid 17¼ cents. It is conceded that in order to secure the maximum tonnage with the minimum consumption everybody having to do with the running of trains must co-operate. The fireman alone might save a considerable sum of money. He now puts 11 scoopsful of coal into the firebox per mile run. If he could manage to get it down to 10, the net earnings of the railways would increase by \$2,500,000. The question is, "would he do it if it was his own coal?" But it must not be left to the fireman alone. Coal can be saved by the engineer, the locomotive foreman and his staff, the yardmaster and his staff, train despatchers, operators, trainmen, and, in fact, by everyone from the superintendent to the call-boy.

It does not pay to run trains at high speeds, for aside from the greater liability to accident, and the relatively greater amount of damage and loss when an accident occurs, the service is expensive. Because of keen competition in certain territories, it would appear to be necessary to schedule some fast passenger trains, but when and where possible the actual running speed should not exceed from 45 to 50 miles per hour.

Last year the average number of passengers per train on Canadian railways was only 62, and the average number of cars was 5.6. The tonnage hauled per passenger train mile should be kept down to the minimum; on the other hand and for obvious reasons in freight service, the maximum tonnage per train mile should be handled, and all through freights should be scheduled slow enough to enable engines to pull their full tonnage under normal weather conditions. The effect of high speed upon coal consumption is not easy to express because of varying conditions, but it should be borne in mind that as speed increases beyond a certain point resistance increases and the efficiency of the locomotive decreases. As an illustration: Take a train running over an undulating subdivision with maximum grades of 1 per cent. A maximum speed of 25 miles per hour may be regarded as an economical speed, but to increase the maximum speed to, say, 40 miles per hour would result in a very material increase in the train resistance and a considerable decrease in the efficiency of the locomotive—the increase in the fuel consumed amounting to approximately 50 per cent. On a low

\*Read before the Canadian Railway Club, Montreal, December 8, 1914.

grade line where big tonnage is hauled, to increase the maximum speed from 25 to 40 miles per hour would necessitate a reduction of probably 50 per cent in the tonnage, and then more coal would be consumed than with double the tonnage at 25 miles per hour. Assuming, however, that the engine could handle 90 per cent of its original tonnage and run at 40 miles per hour, the coal consumed would show an increase of approximately 90 per cent.

There is an economical load for a locomotive. What that load is can be determined only by experience and by a series of tests. The maximum tonnage may not be an economical load, especially on what is known as a low-grade line. An engine given the maximum tonnage which it is capable of hauling on a line with grades of 0.4 per cent, or less, would run into overtime, the fuel consumption would be excessive and it would probably be found that the last straw, speaking metaphorically, had broken the back of the locomotive camel. On the other hand, to underload locomotives in through freight service in both directions is an inexcusable waste.

When, by tests made with a dynamometer car, it has been determined what tonnage a locomotive of a certain tractive power is capable of hauling economically over the maximum grades on a subdivision, operating officials should insist upon engines being so loaded, at least in one direction, and under normal weather conditions. Low temperature, a heavy fall of snow, a greasy rail, or any atmospheric condition that will retard the movement of a train will warrant running with a reduced tonnage, so as to permit reasonably good time being made from the initial to the objective terminal. It does not pay to haul maximum tonnage at the expense of excessive fuel consumption and overtime.

Theoretically, engines should be given their full tonnage rating in both directions, but in practice it is found that this cannot be done, as usually there is a preponderance of traffic one way, and locomotives must run in the opposite direction with reduced tonnage in order to keep the freight moving. However, under the circumstances, if engines haul the maximum load in one direction, the results should be satisfactory.

It might be well to demonstrate the effect of running trains with greatly reduced tonnage. The following statement makes a comparison of actual results on a certain subdivision, the periods "A" and "B" representing two summer months. During "B" the gross tonnage handled one mile was 87,008,449, and items indicated by "x" in "A" are based on this ton mileage:

Item	Period "A"	Period "B"
Average weight of train per mile.....	1,737 tons	2,133 tons
Train miles .....	50,136 x	40,876
Pounds coal used per train mile.....	129	128
Pounds coal per thousand tons hauled one mile .....	75	61
Cost .....	\$22,893.55 x	\$18,637.98
Saving .....		\$ 4,255.57

The saving on this 125 mile sub-division was not due to any change in the physical characteristics of the road nor to the use of more powerful locomotives, but merely to a better loading of trains and during the month the saving amounted to \$4,255.57, as above.

It will be observed that, although the average weight of train per mile during Period "B" was 396 tons more than during "A," the amount of coal consumed per train mile was approximately the same. This will not always follow, but the statement demonstrates clearly that if an engine is not overloaded, it will burn almost as much coal per mile when hauling 75 or 80 per cent. of its full tonnage as when it is loaded to its capacity. The same is true of wages and other engine and train supplies.

It is surprising the effect upon almost every operating item a small increase in the average load per loaded car would have. During 1913 the average weight of contents in loaded cars on all the Canadian railways was 19 tons—a very small load when it is considered that the average carrying capacity was 32.14 tons. An increase in the average contents would result in a decrease in the number of cars required to

carry the same volume of traffic, and fewer cars would lessen the cost of locomotives, train, yard and roundhouse service, as well as some other incidental expenses.

There is now a campaign on to increase the average weight of contents of loaded cars on the Eastern lines of the Canadian Pacific in 1915, the increase aimed at being 3 tons per car. Based upon the traffic handled in 1913, when the average weight of the contents of loaded cars was 20.15 tons, it is estimated that the increased average load would represent a saving in three items alone of no less a sum than \$800,000.

This sum can be saved in several ways.

(a) Select cars of large capacity for heavy freight.

If 80,000 lb. capacity cars were used to haul 100,000 bushels of wheat, the cars would be loaded up to 88,000 lb., and the whole shipment would be carried in 68 cars. To make the shipment in 60,000 lb. capacity cars the cars would carry only 66,000 lb. each and 91 cars would be used. In the former case the average weight of contents would be 44 tons, and in the latter only 33 tons. By using large cars the figures would be:

Contents .....	3,000 tons
Tare .....	1,274 tons
Total .....	4,274 tons

By using small cars:

Contents .....	3,000 tons
Tare .....	1,558 tons
Total .....	4,558 tons

Therefore, under the second plan, in addition to supplying grain doors, switching, inspecting and hauling 23 extra cars, the engines would have to haul 284 additional tons of dead weight from the point of shipment to destination and back again.

(b) Select smaller capacity cars for light and bulky freight. As the smaller capacity cars are approximately the same dimensions as the larger and weigh two tons less, they are just as suitable for hay, furniture, oats, etc., and for such commodities it is profitable to use them.

(c) Consignees who need but one car of freight at a time usually order the minimum carload, as per the freight classification. If the matter were properly represented to them, they might be induced to order in larger units.

(d) When a shipper holds an order for several carloads of freight for the same consignee and destination, it should not be a difficult matter to persuade him to load the full order in the minimum number of cars.

(e) Shippers and consignees who have suffered through car shortages in the past can be shown that the simplest way to prevent a recurrence of such a condition is by loading all cars to their full capacity. Not only will this plan avoid car shortages for a number of years to come, but it will prevent the congesting of terminals, which has also been the cause of a great deal of trouble to shippers and consignees in past years.

Another way to secure the maximum freight tonnage to the minimum tare and in the minimum number of cars is by avoiding the unnecessary movement of empty cars.

When the settlement for the use of foreign cars was on a mileage instead of a per diem basis, the principle that empties should be run in only one direction, and that opposite to the direction of the preponderance of traffic, was pretty generally adhered to. A cross movement of empties was then looked upon as exceedingly bad transportation. Since the change in the system, the penalty for holding foreign cars has been so heavy that under most circumstances it pays to send foreign cars home empty, even when to do so they must travel in the direction of traffic.

The necessity of moving foreign empties homeward promptly has probably had a tendency to weaken the hold which the transportation officer had upon the principle of moving empties in one direction only a few years ago. The principle, however, is as sound today as ever it was, but it



is conceded that, under the changed conditions, it must often be departed from.

The direction in which empties should move is naturally that opposite to the movement of the preponderance of traffic. The cost in that direction is comparatively small because the locomotives returning for loads are light enough to handle them and no additional locomotive mileage is necessary. When, however, empties are moved in the same direction as the balance of traffic, additional locomotive mileage is involved—not only so, but the empties are being sent out of a territory where they are in demand, and for every such movement, an empty must be hauled in the opposite direction to take its place, except for cars of special classes and for which there is no suitable commodity. A conservative estimate of the cost of hauling empty cars is 1½ cents per car mile. If, therefore, an empty car suitable for traffic is sent in the direction of the balance of tonnage, a distance of 300 miles, the total additional mileage involved is 600 miles at a cost of \$9—a sum well worth trying to save.

During last year 24 per cent of the car mileage on Canadian railways was empty. If by some means this percentage could be reduced to say 20 per cent it would represent a large increase in the net earnings of our railways.

## THE STANDARD BOX CAR—A NEGATIVE VIEWPOINT

BY R. W. BURNETT

General Master Car Builder, Canadian Pacific, Montreal, Que.

From time to time we read stirring articles from high railway officers on the desirability of a standard box car; these frequently take the form of a demand, a call to arms to rise and overthrow the mechanical man who, it would seem from these articles, has for many years obstructed progress and caused untold millions of expense by a failure to attain the desired end. Such articles are usually favorably commented on in the railway magazines, the impression seeming to be that the writers must of necessity be right, and the weakness of the mechanical man is sometimes apologized for with suggestions that in time he may come to see the matter in the same broad way as the higher officer.

If the box car situation is analyzed it will be found that the traffic officers and the officers who control the policies of the railroads are responsible for the diversity of box car dimensions, and that no one would be more pleased than the mechanical man if a more limited number of designs were decided on. Cars of varying or unusual dimensions, such as those of more than usual length, height or width of side door, or having large end doors or otherwise fitted for special service or use in a restricted territory; or for service which may be peculiar to the entire territory reached by the home road, are being demanded by the traffic department. It is not for the mechanical man to say that these cars, which may make 90 per cent of their mileage on the home road shall be built to the standard dimensions said by the traffic department to be unsuitable for the home service, in order that the cars may be standard for the 10 per cent of their mileage which may be made on foreign lines.

These matters can only be settled by the traffic department and others who decide on matters of policy, which affect almost entirely their own department. If persons who are at all worried about the box car situation will take the trouble to investigate, they will find that the box cars built in the last few years, especially those with steel superstructure, are costing very little for repairs. Barring wrecks, the repairs are confined almost exclusively to couplers, wheels, trucks and other parts which are all standard. If any large part of these repairs is due to a weakness in the standard the doctrine of adopting a standard box car is then proved unsound, as the standards were usually amply strong to meet the demands of service of the period for which they were designed; if weak,

the design has been outgrown in the rapid development of the railways, which is the case with the car itself and which to some extent will be the case with any car that might be adopted at this or any other time.

From the large percentage of steel frame box cars built during the last few years the indications are that this design will be very largely used in the future. These cars are largely constructed of rolled shapes which seldom need renewal, even when a car is wrecked, as they can easily be straightened or reformed to the original shape at any car repair point. It has been found unnecessary to carry rolled shapes in stock for repairs, and as the parts of the cars which fail are the parts which are already standard, it is only necessary to carry in stock lining and decking, which are being standardized. The cars which are giving trouble now, and which are largely causing the uneasiness that brings forth the letters and articles referred to, are the cars which were built from ten to twenty years ago and represent the best state of the art at that time. If the best of them had been adopted as standard and had so continued to the present day, there is no doubt that the present repair bills would be about double what they are, and this to a degree is what it would mean in the way of expense ten or twenty years hence should a standard box car be adopted now.

It is true that we sometimes see appliances on cars, the value of which may be very much questioned, but it is probable that the net result of the use of these questionable devices may be on the credit side of the ledger for the railroads as a whole, as they are for the most part being developed towards some desired end with the final result that a simple and effective device is secured. It is also true that occasionally a designer makes an unfortunate mistake in some vital part of the car which results in bad failures on a certain series of cars, but these cars are usually so thoroughly advertised by the embargo placed on them by other roads that the railroads are benefited because the same mistake is not likely to be repeated.

If a box car with wooden underframe and superstructure were to be continued it would probably be advisable to go very much more into the standardizing of the parts than has been done, as the wooden car differs from the steel car in that the amount of material carried for repairs increases with the life of the car, whereas the corresponding parts do not have to be carried at all for steel underframe and steel superstructure cars, since more than enough parts are saved from fires and cars demolished in wrecks to take care of the few renewals that are required. At the Angus shops of the Canadian Pacific, where we have been ordering small lots of 250 box cars at a time to keep the shop going in a small way during the depression, every lot of cars is built slightly different; this in no way affects the desired interchangeability and will reduce the cost of maintenance. These changes are made principally for the following reasons: To protect the lading from the elements; to increase the strength; to reduce the weight, and to reduce the cost of maintenance. Examples are given below of how the conclusions are arrived at governing these changes.

*Protecting the Lading from the Elements.*—We have a sprinkler arranged to test a sufficient number of cars coming out of the shops to determine any possibility of leakage through the roofs, sides and ends. This is not the impractical fire hose test, but is made to approximate the worst storm conditions, and we do not stop when any weakness is found, until we find a substantial way of remedying the trouble. This is not usually done by car builders and is obviously much better than waiting for the claims department to report trouble, and the writer considers it unfair for shippers to be forced to use a car designed in all small details by persons who have not had the opportunity to make all of these investigations.

*To Increase the Strength.*—Minimum weight being a very important factor in the designing and building of cars in the effort to reduce weight, we occasionally turn out a finished design that may require slight strengthening in some of the parts. The necessity of increasing strength is usually confined to the

superstructure as we have from experience largely overcome the weaknesses that were common to the underframe.

**To Reduce Weight.**—While not so necessary as increasing strength, yet it is important to reduce weight where it is possible to do so with safety. Many opportunities are afforded with the variety of rolled shapes available, to accomplish this without extra cost, and often with a reduction in cost.

**To Reduce Cost of Maintenance.**—While the cost of maintenance is carefully considered by the designer, yet the cars in actual service when carefully observed bring to notice certain items of expense that can be remedied, and in some cases entirely eliminated. The use of rivets in place of bolts is probably one of the most important items to be considered in repair work. Bolts were used in the past for securing parts that would require frequent renewals, but as the failures to these parts have been reduced the bolt, which is expensive in maintenance, has been replaced by the rivet. Cast steel and pressed shapes in place of malleable iron have also to be considered here.

The comparatively low average cost of maintenance of the present day, considering the large amount of old wooden equipment still in service, is entirely due to the present design of car which confines the repair expense almost exclusively to the wearing parts, outside of a few unfortunate mistakes in design, as previously mentioned. It must also be borne in mind that the car of the present cannot show the lowest cost of repairs, while relieving the high cost of repairs to the old wooden car.

To sum the matter up, the parts that are movable and need to be renewed should be and are standardized. The use of rolled sections gives us a car which is otherwise a car of standard parts. We also have minimum requirements for the center sill construction which would seem, for the reasons given above, to be about as far as we should go at present in standardizing the box car, except that limiting outside and inside dimensions should be arranged for; this should be attended to by the traffic department. One of these dimensions, the height of running boards, it would seem very essential to decide on in order that the roads will not keep on increasing the height of their cars until the government concludes that there is not sufficient room for the trainmen on top of the cars and issues an order that bridges, tunnels, etc., must be raised to give sufficient clearance, which would be very expensive.

As small changes in the development of the car do not increase the amount of material to be carried in stock, or the cost of maintenance, why should a complete standard car be adopted, which, if followed, will shut off the improvement of details which is necessary if we are to progress?

### A WAY TO STOP TRESPASSING

R. C. Richards, chairman of the Central Safety Committee of the Chicago & North Western, is distributing cards on which is printed a diagram showing the number of persons killed and injured during the 25 years ending with 1914 while trespassing on railway tracks or cars, below which is the following note: "Why not enact and enforce a law similar to that recommended by the National Association of Railway Commissioners, a copy of which is shown on the reverse side of this card, to prevent this slaughter."

























The proposed bill referred to provides that "it shall be unlawful for any unauthorized person to walk, ride or drive upon or along the tracks, or within the right of way of any railroad company, or to cross such tracks or right of way at any place other than at a public or private crossing." An exception is provided for employees of a railroad engaged in the performance of their duties, persons going upon the property to save human life or to protect property, and persons going upon such property for the purpose of transacting business with the company or as passengers. It is further provided that station agents or section foremen shall have the same power, and shall be charged with the same duties in the enforcement of the act as are given to deputy sheriffs

by the general laws of the state. The proposed bill also provides that any person wilfully violating the act shall be deemed guilty of a misdemeanor and liable to a fine of not more than \$100, or to imprisonment in the county jail for not more than 90 days, or both.

The diagram shows that 113,570 persons have been killed and 123,611 injured, a total of 237,181, while trespassing, during the last 25 years, and that 66 per cent were citizens of the locality in which the accident occurred, mostly wage earners; 14 per cent were children under 18 years and 20 per cent tramps or "hoboes."

### BEAM LIGHT SIGNALS ON THE PENNSYLVANIA

The light signals used on the Pennsylvania Railroad in place of semaphores for both night and day indications have been described in the *Railway Age Gazette* of January 8, page 61, and February 26, page 366. In addition to the high-speed and me-

ASPECTS		
SEMAPHORE	LIGHTS DAY/NIGHT	MEANING
		STOP
		PROCEED PREPARED TO STOP AT NEXT SIGNAL
		PROCEED PREPARED TO PASS NEXT SIGNAL AT MEDIUM SPEED
		PROCEED
		PROCEED AT MEDIUM SPEED PREPARED TO STOP AT NEXT SIGNAL
		PROCEED AT MEDIUM SPEED
		PROCEED AT LOW SPEED PREPARED TO STOP TRACK MAY BE OCCUPIED OR NEXT SIGNAL AT STOP
		PROCEED AT LOW SPEED
		STOP THEN PROCEED - RULE 504
		PROCEED PREPARED TO STOP AT NEXT SIGNAL
		PROCEED PREPARED TO PASS NEXT SIGNAL AT MEDIUM SPEED
		PROCEED

Semaphores and Their Equivalents in Light Signals

dium-speed indications described in the articles referred to, provision has been made at interlockings to give low speed indications also; and we give herewith the complete code of twelve aspects as printed for the use of enginemen. These signals are in use from Fifty-ninth street, Philadelphia, to Bryn Mawr; and this section includes two interlockings, OB and WH.



# Fuel and Tonnage Performance on the Seaboard

## A Study of Records Which Show Comparative Results for the System and the Various Operating Divisions

By L. G. PLANT

Fuel Engineer, Seaboard Air Line, Portsmouth, Va.

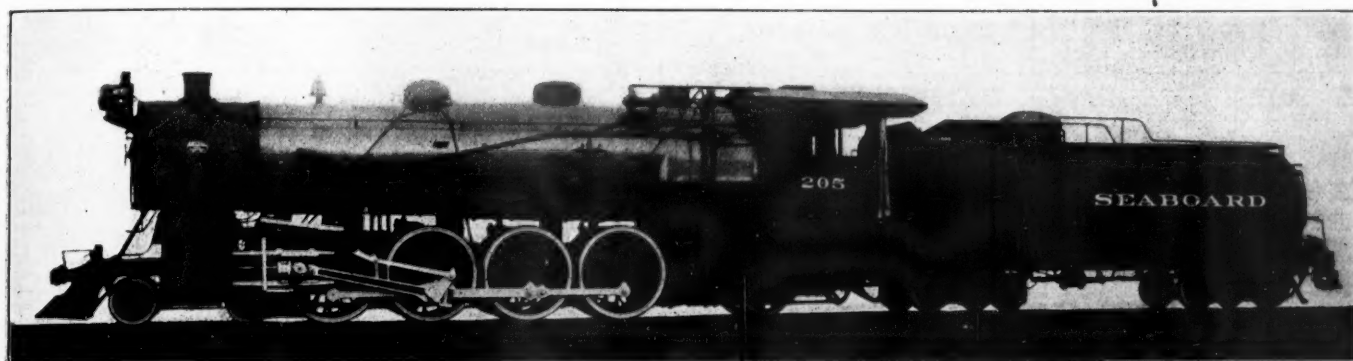
The average weight and speed of freight trains has so important a bearing upon fuel consumption per ton-mile that any comparison between fuel consumption on two or more operating divisions, or the relative efficiency of different types of locomotives, should be based upon these operating conditions. Fuel records are of little value unless the particular conditions under which the records were made are also shown.

For this reason a locomotive performance report is issued monthly on the Seaboard Air Line showing not only the average fuel record of every locomotive in regular service, but the average time on the road, the speed, the miles run and tonnage hauled per trip. This report was designed originally for use in connection with an engineer's individual fuel record as a means

torily over a portion of this division having 1 per cent ruling grades. The report also shows that the Mountain type locomotive is more economical in coal consumption than the Pacific type, except on trains 9 and 10, which are faster and not so heavy as trains 1, 2, 3 and 4. The accompanying table gives the leading data for the Mountain, Mikado and Pacific type engines.

### General Data

	4-8-2	2-8-2	4-6-2
Gage .....	4 ft. 8½ in.	4 ft. 8½ in.	4 ft. 8½ in.
Fuel .....	Soft coal	Soft coal	Soft coal
Tractive effort .....	47,800 lb.	50,200 lb.	36,000 lb.
Weight in working order .....	316,000 lb.	282,000 lb.	222,500 lb.
Weight on drivers...	210,500 lb.	207,500 lb.	141,000 lb.
Weight on leading truck .....	53,000 lb.	26,500 lb.	43,000 lb.



Mountain Type Locomotive Recently Placed in Service on the Seaboard Air Line

of locating excessive fuel consumption upon various engines; but it has since proved a valuable source of data concerning the relative economy of the various types of engines in service and the comparative fuel efficiency of each operating division. The report includes locomotives in both freight and passenger service, although each class is shown on a separate sheet and reported by divisions.

Two copies of the Locomotive Performance Report for the North Carolina division are shown. The report of the January record of locomotives in through passenger service between Raleigh, N. C., and Columbia, S. C., includes a Pacific type of the conventional design and a newly designed Mountain type, several of which have recently been placed in service on these runs. While this report shows that the average number of cars hauled did not exceed 10, these engines have hauled 13 cars satisfac-

Weight on trailing truck .....	52,500 lb.	48,000 lb.	38,500 lb.
Weight of engine and tender in working order .....	499,000 lb.	465,000 lb.	396,800 lb.
Wheel base, driving..	18 ft.	16 ft. 6 in.	12 ft. 6 in.
Wheel base, total...	38 ft. 11 in.	34 ft. 9 in.	32 ft. 9 in.
Wheel base, engine and tender .....	76 ft. 8½ in.	72 ft. 6½ in.	66 ft. 3 in.

### Cylinders

Kind .....	Simple	Simple	Simple
Diameter and stroke..	27 in. x 28 in.	27 in. x 30 in.	23 in. x 28 in.

### Wheels

Driving, diameter over tires .....	69 in.	63 in.	63 in.
------------------------------------	--------	--------	--------

### Boiler

Working pressure ...	190 lb. per sq. in.	170 lb. per sq. in.	180 lb. per sq. in.
Outside diameter of first ring .....	76½ in.	73 15/16 in.	66 15/16 in.
Firebox, length and width .....	114½ in. x 84½ in.	108 in. x 84½ in.	106¾ in. x 71¾ in.



Seaboard Air Line Mikado Type Locomotive

## BOILER—(Continued.)

Tubes, number and outside diameter ...	193—2¼ in.	230—2 in.	199—2 in.
Flues, number and outside diameter ...	34—5½ in.	32—5½ in.	24—5½ in.
Tubes and flues, length	21 ft.	20 ft.	19 ft.
Heating surface, tubes and flues .....	3,396 sq. ft.	3,290 sq. ft.	2,609 sq. ft.
Heating surface, arch tubes .....	26 sq. ft.	26 sq. ft.	26 sq. ft.
Heating surface, fire-box .....	293 sq. ft.	221 sq. ft.	183 sq. ft.
Heating surface, total	3,715 sq. ft.	3,537 sq. ft.	2,818 sq. ft.
Superheater heating surface .....	865 sq. ft.	759 sq. ft.	540 sq. ft.
Equivalent heating surface* .....	5,012.5 sq. ft.	4,675.5 sq. ft.	3,628 sq. ft.

SEABOARD AIR LINE RAILWAY								Form 1700.		
REPORT OF LOCOMOTIVE PERFORMANCE										
NORTH CAROLINA			Division		Month of		JANUARY		1915	
Between			RALEIGH		and		COLUMBIA			
Loc. No.	Run. Service	AVERAGE PER TRIP			POUNDS COAL CONSUMED			REMARKS		
		M.P.M.	TONNAGE (Freight Service)	CARS (Passenger Service)	Per 100 Tons Miled (Freight Service)	Per Car Mile (Passenger Service)	Per Mile (Switching Service)			
THROUGH FREIGHT										
MOUNTAIN TYPE										
ENGINES										
200	6-45	30.2			9.9		10.9			
201	6-55	29.5			8.6		10.6			
202	7-00	29.1			9.2		10.0	"	"	
203	6-40	30.6			9.2		11.4	"	"	
204	6-35	31.0			9.1		10.7	"	"	
209	7-10	28.5			9.1		11.3	"	"	
PACIFIC TYPE										
105	7-05	28.8			9.0		12.0			
THROUGH PASSENGER										
MOUNTAIN TYPE										
ENGINES										
100	5-45	35.7			9.6		10.6	PACIFIC TYPE		
104	5-50	35.6			8.2		11.2	ENGINES		
AVERAGES										
		13	1397				129			
		11	958				174			
		10	1217				156			

A Locomotive Performance Sheet for the North Carolina Division for January, 1915

Grate area .....	66.7 sq. ft.	63.2 sq. ft.	53.2 sq. ft.
Water capacity .....	9,000 gal.	9,000 gal.	9,000 gal.
Coal capacity .....	17 tons	17 tons	15 tons

\*Equivalent heating surface = total evaporative heating surface + 1.5 times the superheating surface.

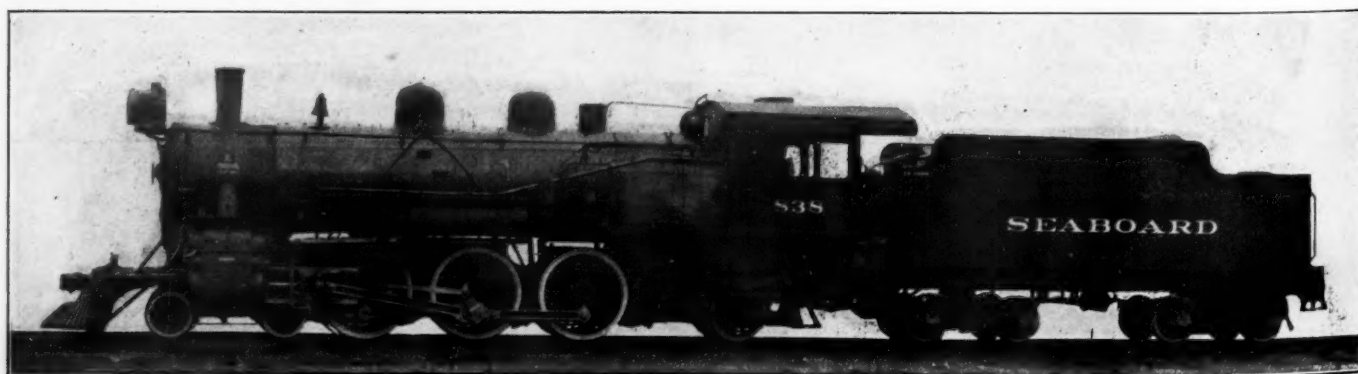
The report of the November performance of all locomotives in through freight service on the North Carolina division illus-

trates the wide range in average speed, tonnage hauled and fuel consumption per ton-mile to be found on almost any operating division where several different types of locomotives are in service. Mikado, Pacific and Consolidation type engines are included in this statement. The Mikados have been in service only a few

SEABOARD AIR LINE RAILWAY							Form 1700.	
REPORT OF LOCOMOTIVE PERFORMANCE								
NORTH CAROLINA			Division	Month of		NOVEMBER	1914	
Between			RALEIGH	and	HARTLET, MONROE and CAYCE			
Loc. No.	Run. Service	AVERAGE PER TRIP			POUNDS COAL CONSUMED			REMARKS
		M. P. H.	TONNAGE (Freight Service)	CARS (Passenger Service)	Per 100 Tons Miles (Freight Service)	Per Car Mile (Passenger Service)	Per Mile (Switching Service)	
		THROUGH			FREIGHT			
MIKADO								
300	7:25	13	1381		130			
301	7:05	16	1260		139			
302	7:55	10	1350		135			
303	7:15	14	1180		156			
304	11:50	12	1458		114			
305	11:20	12	1489		114			
306	10:50	14	1504		126			
307	11:46	13	1435		119			
308	12:25	12	1461		125			
309	12:20	12	1451		133			
PACIFIC								
815	7:45	15	1038		154			
816	9:15	12	1072		172			
823	9:30	11	826		187			
824	9:50	11	946		182			
825	6:40	7	907		173			
CONSOLIDATION								
910	12:00	9	1210		165			
919	9:45	11	1225		148			
Averages								
MIKADO		13	1397		129			
PACIFIC		11	958		174			
CONSOLIDATION		10	1217		156			

A Locomotive Performance Sheet for the North Carolina Division for November, 1914

weeks, and those of the Pacific type a little over a year; both are equipped with superheaters and brick arches. Some preference in the character of trains hauled may have been given the Mikados, but the greater capacity and economy of this type in comparison with the other locomotives is remarkable. In this instance the Pacific type engines appear to be rather an extravagant type for freight service, as they not only burn considerably more coal per ton-mile than the Mikados, but their average speed is lower. Both of these types are operated under the same maximum speed limit, hence the Pacific type is at a disadvantage on ascending grades and in accelerating trains. The two Consolidation engines reported at the foot of this statement are somewhat older than the others; No. 919 is equipped with a

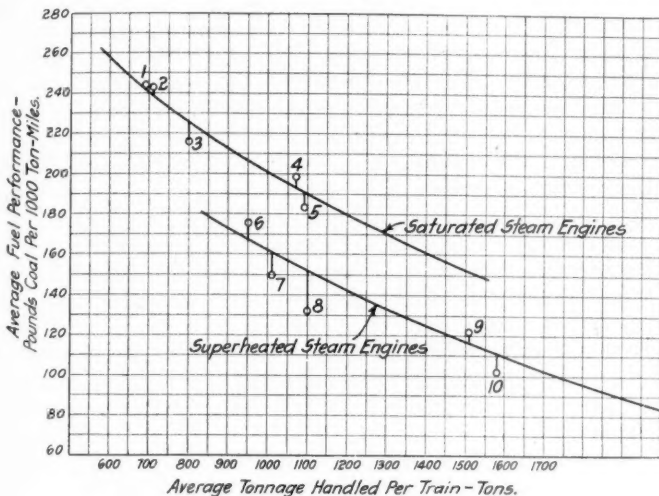


Pacific Type Locomotive in Service on the Seaboard Air Line



superheater, while No. 910 uses saturated steam. In other respects the engines are identical and their records offer an interesting comparison bearing upon the efficiency of the superheater in every-day service.

The important question in regard to the superheater or any other device which makes for economy, is not what efficiency can be shown under test conditions; but what economy or increased capacity is being demonstrated daily under a variety of operating conditions. The real value of the superheater is often



- 1—Ten-wheel Locomotives, Virginia Division
- 2—Ten-wheel Locomotives, North Carolina Division.
- 3—Ten-wheel Locomotives, Georgia Division
- 4—Consolidation Locomotives, North Carolina Division
- 5—Consolidation Locomotives, Virginia Division
- 6—Pacific Type Locomotives, North Carolina Division
- 7—Pacific Type Locomotives, Georgia Division
- 8—Pacific Type Locomotives, Virginia Division
- 9—Mikado Type Locomotives, North Carolina Division
- 10—Mikado Type Locomotives, Virginia Division

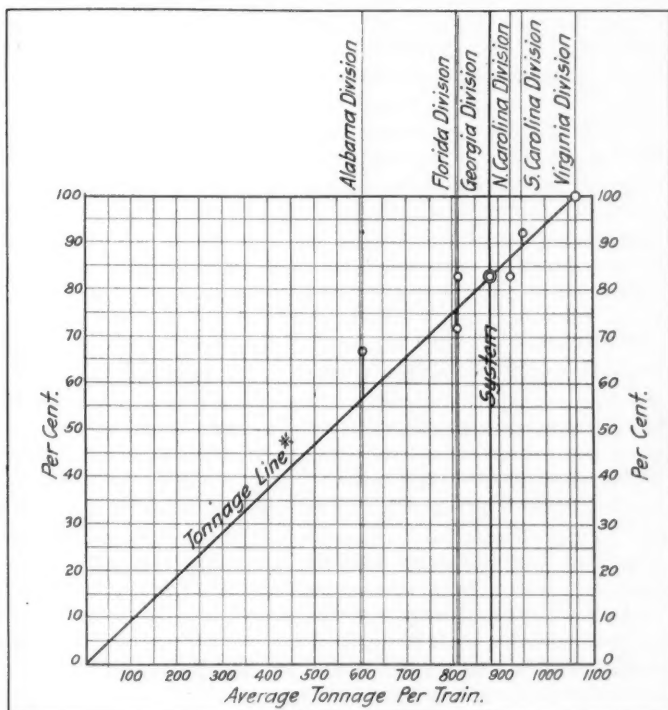
Chart I—Comparative Performance of Freight Locomotives on Divisions with Ruling Grades of 1-2 per cent

either obscured or exaggerated when the comparison is made between superheated and saturated steam locomotives of different sizes and types and operating under dissimilar conditions. Chart I is intended to show the actual comparative results obtained from operating a large number of superheated and saturated steam locomotives on divisions having the same maximum grades. Locomotives of the Ten-wheel, Consolidation, Pacific and Mikado types have been taken for comparison, and their fuel and tonnage records on the Virginia, North Carolina and Georgia divisions are shown on this chart. The height from the base line represents the fuel consumption per ton-mile, while the distance to the right represents the average tonnage per train hauled by each group of engines. For instance, the average fuel consumption of the Ten-wheel engines, Virginia division (point 1) is 244 lb. per thousand ton-miles, and the average weight of train hauled is 690 tons. The Mikado type engines on the same division (point 10) averaged 102 lb. of coal per thousand ton-miles and 1,580 tons hauled per train.

The points representing the performance of each group of saturated steam locomotives lie approximately upon one curve, while the points representing the performance of the superheater locomotive lie upon another curve somewhat lower than the first. The distance between these two curves represents approximately the saving in fuel per ton-mile effected through the use of superheated steam on engines of various sizes and types. The data for this graphical comparison was taken from the locomotive performance report for October, 1914. If the averages shown on this form for the November, 1914, performance of freight engines on the North Carolina division were also plotted on this chart, the records for the Mikado and Pacific type locomotives would lie adjacent to the superheater curve. A point representing the performance of engine 919 (superheater) would also lie near this

curve, while a point representing the performance of engine 910 (saturated steam) would lie near the saturated steam curve.

Chart II is designed to show the relative fuel and tonnage efficiency of six operating divisions and the system as a whole. The average tonnage hauled per train on the Virginia division being the heaviest (1,066 tons), the tonnage efficiency of this division is assumed to be 100 per cent. The fuel consumption on the same division is the lowest (182 lb. of coal per thousand ton-miles); hence its fuel efficiency is also assumed to be 100 per cent. The tabulated figures for tonnage and fuel efficiency closely approximate each other; that is, fuel consumption per ton-mile increases in about the same proportion that the average tonnage hauled per train decreases. For instance: the average weight of trains hauled on the Florida division was 810 tons, or 76 per cent of the average tonnage on the Virginia division; the average fuel consumption was 253 lb. per thousand ton-miles, indicating an actual fuel efficiency 28 per cent lower than on the Virginia division, or 72 per cent. In this instance, the relative fuel efficiency on the Florida division may be considered as 4 per cent less than on the Virginia division, tonnage considered. Similarly, the relative fuel efficiency on the North Carolina division is 4 per cent



Division	Average weight of trains		Average fuel performance	
	Tons	Relative per cent	Lb. coal per 1,000 ton-miles	Relative per cent
Virginia .....	1,066	100	182	100
South Carolina .....	950	89	197	92
North Carolina .....	927	87	219	83
Georgia .....	811	76	219	83
Florida .....	810	76	253	72
Alabama .....	607	57	270	67
System .....	880	83	218	83

Note.—The distance of the circle above or below the Tonnage Line\* indicates the greater or lesser relative fuel efficiency on each division.

Chart II—Relative Fuel and Tonnage Efficiency on Six Operating Divisions

less than on the Virginia division; while the South Carolina, Georgia and Alabama divisions show relative efficiencies respectively 3 per cent, 7 per cent and 10 per cent above the Virginia division and the system as a whole.

Where the relationship between fuel and tonnage efficiency is so close, fuel consumption per train-mile is not an unfair unit for gaging the relative efficiency of several operating divisions.

Credit for a great many reductions in fuel consumption per ton-mile can be given to an improvement in train loading. A

study of the tabulated figures shown on chart II indicates that if, for instance, the average tonnage on the Florida division (810 tons) could be increased so as to equal the tonnage hauled on the South Carolina division (950 tons), the fuel consumption could presumably be reduced from 253 lb. per thousand ton-miles to approximately 200 lb. Fuel and tonnage efficiency are so interdependent that any systematic effort to reduce the consumption of fuel per ton-mile should be supplemented with a campaign for the maintenance of a full, but not excessive, uniform train load.

### TRAFFIC CLUB OF CHICAGO

The eighth annual banquet of the Traffic Club of Chicago was held at the Hotel LaSalle, Chicago, on February 25, with nearly 700 in attendance. President J. Charles Maddison presided and B. D. Caldwell, president of Wells, Fargo & Co., acted as toastmaster. The speakers were William Sproule, president of the Southern Pacific Company, and Col. H. P. Bope, vice-president of the Carnegie Steel Company. James J. Hill, who had been invited to speak, but was unable to be present, sent a paper which was read by President Maddison. Mr. Hill's paper, as well as the addresses of the two speakers, dwelt mainly on the causes for the depressed condition of business, and all agreed in ascribing the cause to a surplus of uninformed and unnecessary legislation against business.

"What productive activity needs most," said Mr. Hill, "is simply a period of freedom from uncertainty resulting from constant political attacks. Business needs a rest cure. Uncertainties from tariff revisions and banking legislation are profound. The trade commission law asserts the right of a federal government to control and regulate business as a whole, not merely that affected with some public use or that which offends in some way against the law, but the peaceful and legitimate conduct of ordinary affairs. No more money, or more credit, or foreign markets, or a merchant marine or any other accessory advocated is so necessary to the country at this time as a period of rest from legislative interference with, and arbitrary control of, the country's business. Even if this be granted revival must be slow in halting. The whole country wants prosperity. The main conditions favorable to a happy change exist. It calls only for understanding, co-operation and harmony between all those elements which unite to make it both economically and politically one."

Mr. Sproule said in part: "The public interest in transportation is as keen as it is misinformed. The public interest in transportation really rests in the one word 'service.' One of our difficulties is that the subject when thus regarded looms so large as to extend far beyond the horizon in most lines. The fact is, the public interest in transportation is different from the interest the public takes in transportation questions in these times.

"Wherever civilization exists the go-ahead spirit of the American people is proverbial. Like every other proverb this one has its exception. That exception is transportation. American transportation has lost its momentum. Today railroad construction in the United States has ceased except to finish a few odds and ends. The railroads are under the heavy hand of repression. The public attitude with respect to them has very little to do with the public interest. The kind of interest on the part of the public which is aroused by the platitudes and prejudices voiced from 10,000 political platforms is at variance with what is really to the public interest. These harangues prate about a very few phases of the transportation question, and minor topics are magnified for the popular eye to look like big things.

"The railroads are accused of influencing politics. It is strange, indeed, that by popular will the railroads are denied access to the forum which makes their laws, determines their tribunals, fixes the basis for their taxes and designates by enactment many operating matters and expenditures that be-

long to the domain of management. Methods for presenting the case of the transportation companies in the seats of legislation may in various ways, and at various times have been defective, but not more so than the proposals and methods which the transportation companies believe it to be their right and duty to combat.

"Following upon all this misrepresentation and play upon prejudice has come a considerable period of public distrust with consequent withdrawal of confidence in the greatest industry in this country. This lack of confidence was in turn followed by general business depression, for all business is based upon credit and credit has its foundation in confidence. It is in consequence of these conditions that we are going through a period of unemployment and distress, the like of which this nation has never known. It is the employer who is first out of employment. As a natural sequence he is followed by the employee, who next finds himself out of work. Unemployment begins only when the employer himself begins to be unemployed. We have this period of unemployment because all business is bewildered and uncertain. It does not know whether it may proceed in safety. This condition began with transportation and now extends to all business. The greatest trouble with this country today is that every business which has been developed by the genius of the American people has become the object of unforeseen attacks from some quarter, or feels the threat or danger of attacks."

Colonel Bope spoke on the future relations of manufacture to transportation. In discussing legislation he said that in the past five years over 62,000 laws have been passed in this country, 2,000 by the federal congress and 60,000 by the state legislature. "We have apparently gone legislation mad," he said. "In the Sixty-Third Congress there have been introduced in the Senate over 7,000 bills and resolutions and in the House over 23,000, of which about 400 have been passed. The railroads have had more than their share of these enactments. For one, I do not feel that the expansion of trade in this country, so much of which is due to the railroads, could or would have been possible had the Interstate Commerce Commission been in existence during that period when railroad building was so active and when faith in the future was so large an element in the development of the country."

After discussing the needs of the railroads he said:

"On the other hand, there is something due the manufacturer from the railroads. A study of past conditions shows that when the railroads have been buying the most freely there has been the greatest prosperity and conversely the greatest depression. Is it not possible to obtain a more equal division of railway purchases so that they may not all largely come in a short period, creating demands which overtax every facility of manufacturing, causing dissatisfaction, delays and loss, to be followed by little or no buying when the changed conditions mean reduction of values, output and employment. There is a certain steady depreciation each year due to use. Let these demands come with regularity; not always to the highest point, that would be too much to expect, but with some percentage in a fixed range. This would mean steadier operation, more stable values and a larger measure of return for both producer and transporter."

AN ARGUMENT FOR POWER INTERLOCKING.—Where state laws governing liability for personal injuries to employees from obstructions on the right of way are very severe, and are strictly enforced, as in Texas, power plants are the only suitable interlocking in places where there is much walking beside the track, as in switching. The power switch movements can be placed below the level of the ties and the wires conducted underground, which cannot be profitably done with mechanical connections. In such cases, care should be taken to provide proper drainage, or the bills for repairs are liable to be greater than personal injury claims.—W. H. Arkenburgh.



# Arbitration of Engineers' and Firemen's Demands

## Continuation of Testimony and Cross-Examination of A. W. Trenholm on Effect of Demands on Operation

A. W. Trenholm, general manager of the Chicago, St. Paul, Minneapolis & Omaha, and chairman of the Conference Committee of Managers, representing the Western railways, occupied the witness stand throughout last week at the hearing in Chicago before the board of arbitration on the demands of the engineers and firemen. He completed his direct testimony on the effect on operating conditions of the enginemens' demands on Tuesday, February 23, after having been on the stand since February 16, and cross-examination was taken up by Warren S. Stone, grand chief of the Brotherhood of Locomotive Engineers.

Mr. Stone asked if it was not common practice after a committee representing the men and the officers of the company had entered into an agreement and both understood it alike, for the company to allow some timekeeper to say that it meant something else? Mr. Trenholm thought that such cases were very rare. Mr. Stone said a number of roads have traveling or chief timekeepers, who make trips over the road and that one trip of this kind usually means business for the brotherhood committees for the next 10 months. He asked if there was not an incentive for an ambitious young official to attempt to operate his department as economically as possible, and therefore to construe schedules in favor of the road as often as possible.

"No, I think there is not," said Mr. Trenholm, "because one of the qualifications that it is necessary for an ambitious young superintendent to have to advance in the railroad business is to do things right, and if he hasn't got judgment enough to interpret and apply a contract between his superior officer and the men he is not likely to get very far in the railroad business."

"Is it not a fact that the operating official knows the men will not strike for a few cents or a few dollars?" asked Mr. Stone, "and that he is perfectly safe in clipping off a little here and there by any ruling he may make?"

"Absolutely no," said Mr. Trenholm. "I don't believe that any officer would so belittle himself as to do anything of that kind, and I think if he did on any properly officered railroad the man who did it would be censured very severely."

"On some railroads the man who did it would be promoted," said Mr. Stone.

In discussing the demand of the men for rates of pay based on the weight on drivers, Mr. Trenholm said he would not oppose that as against the cylinder classification, that both involved technical inconsistencies, but that he objected to the enormous increase in wages involved in the proposed re-classification on the weight basis. "I see no objection," he said, "if the transfer is made and made properly, so that everything is equalized when you do away with the present basis. Then adjust the wages if there is any adjustment necessary." Mr. Stone said that if the men had retained the cylinder basis in their demands they probably would have asked for a greater increase in pay for each type of engine.

This led to an argument as to the proper return on capital in which Mr. Trenholm said that labor is entitled to fair and reasonable compensation and capital to a fair and reasonable return on its investment, which he thought would be 6 or 7 per cent.

### MR. STONE'S DEFINITION OF CAPITAL

Mr. Stone gave as a definition of capital: "Capital is nothing in the world," he said, "but labor saved and materialized. The man who has capital holds it because the great mass of workers are willing he should hold it and the law gives him possession of it and makes it possible for him to hand it down from generation to generation, with the result that 72 per cent of our so-called American citizens are workers, and contribute a certain percentage of their daily labor to a very few of the idle rich, who, in turn, control not only our railroads, but all the rest of

the big businesses." Mr. Stone added that he was "neither an anarchist nor a socialist."

Charles Nagel, formerly Secretary of Commerce and Labor, and one of the arbitrators, asked Mr. Trenholm a number of questions on the subject of government regulation. Mr. Trenholm admitted the need for regulation because of the results of competition among the railroads in former years.

"The question today," said Mr. Nagel, "is whether we have not learned to place our sole reliance upon regulation and to place too much confidence in the mere making of rules, instead of counting somewhat upon the enterprise itself. Is there not some question whether the railroads are not suffering from a multitude of authorities that are undertaking to regulate at one end, and powerful labor organizations working on the other end, and the same organizations in your legislatures, advocating adverse legislation?"

"I think there is no doubt about that," replied Mr. Trenholm.

Referring to a statement of Mr. Trenholm's, that the men on the Omaha were willing to give an honest day's work for an honest day's pay, Mr. Stone said they had given about a 99 per cent strike vote. "Well, I wouldn't blame them," said Mr. Trenholm. "A number of men asked me how they should vote and I told them the way it was put up to them they could not do any other way and do justice to their organization."

Mr. Stone said he believed Mr. Trenholm had said that he did not believe "we had reached the limit of human endurance yet."

### DOES AN ENGINEER WORK HARD?

"I never heard the men talk about the limit of human endurance," replied Mr. Trenholm. "I have never heard that except from some grand officers of labor organizations. I am very much opposed to overworking men in the transportation service."

At one point Mr. Trenholm remarked that some engineers he knew "live pretty well" and that the life of an engineer is "a good, healthy life."

"You don't see these fellows who are worn out and thrown on the scrap pile," said Mr. Stone.

"I have not seen any very extensive scrap heap around where I am. I presume, with the very large number of men you represent and over so vast a territory, there are bound to be a great many failures. There are a great many failures in any line of life. General managers, even, are dropping off pretty rapidly these days," says Mr. Trenholm.

"Is there any hard work about an engineer's duties at all, from your standpoint?" asked Mr. Stone.

"Why, there are sometimes long hours," replied the witness. "There is always the responsibility of the engineer. He has got to be on the alert at all times. But speaking of his ordinary day's work, there is not anything in an engineer's life, I think, that is very laborious work. An engineer has been relieved of everything he could consistently be relieved of. Engineers used to come around before they went out and look their engines over pretty carefully, used to do some work on their engines themselves. It is an exception for an engineer to do that nowadays."

"At the same time they are asking to be relieved of putting their tools on locomotives and such other necessary details, they are demanding an arbitrary payment for 30 minutes' 'preparatory time.' It is inconsistent to ask relief from the final vestige of preparatory duties and demand at the same time additional pay for doing the very work from which they are asking to be relieved. There is no reason why engineers and firemen should not do such work. They are the most capable to do it and are made of no finer clay than the rest of us. We all have to work."

"If a crew has made much less than 100 miles and worked less

than 10 hours, yet under the guaranteed minimum day is paid for 100 miles or 10 hours," said James M. Shieean, counsel for the railways, "you think it is perfectly proper they should be asked to do these incidental duties?"

"Yes," replied the witness, "I never heard an engineer object to it. A good engineer wants to do it himself to be sure it is properly done."

Speaking of the rule requiring payment for preparatory time, Mr. Trenholm said if a man is paid on an hourly basis he should be paid for every minute of his time.

"But 79 per cent of the freight engineers are paid by the mile," said Mr. Stone.

"All right," said Mr. Trenholm, "then he is paid for it. An engineer does not make miles. His ability to make miles depends very largely on the facilities he is given by the railroad."

"If a man ran 100 miles in three hours he would be paid for 100 miles. Would he owe the company anything then?" asked Mr. Stone.

"That would depend, in my judgment, on the circumstances."

"Hasn't he given you a full day's work of 100 miles or 100 pieces?"

"No pieces about it. He don't make miles. He has nothing to do with making miles. He cannot control a mile. He starts out on a run of 125 miles, and he may do it quickly if all the conditions are favorable, but on the other hand, he may be delayed and be out more hours than the miles would cover. When his miles exceed his hours when divided by 10, he is paid in miles, and when his hours are greater he takes the hours. He is guaranteed a day in both cases."

"You are not willing to concede," said Mr. Stone, "that when a man runs 100 miles he has given you the equivalent of a day's work and owes nothing?"

"I concede it under the ordinary conditions of railroad-ing," said Mr. Trenholm, "and I don't claim the right to put him in another class of service, or work him 10 hours to equal his hundred miles. But if he got into a terminal and there was an emergency, and I should want him to go out and do something and I used him for an hour or two hours, I claim I don't owe him anything for the hour or two on this emergency engine. If he runs 150 miles he is paid 15 hours for four or five hours' work, 364 days in the year, and if I happened to need him for the other day on a little bit of a job I would not feel like paying him extra for it."

Mr. Stone asked if he thought the men ought to throw it in for good measure. Mr. Trenholm thought he was not asking them to throw it in, but that the road had paid for it. Mr. Stone insisted that the railroad had earned its revenue by miles, but is not willing to share it with the engineer on that basis.

"The engineer has always got his full share of the earnings of the railroads, as compared with any other labor on the railroad," was the reply.

In questioning on the automatic release proposal, Mr. Stone asked if the roads could not change their schedules so as to avoid the effects of the automatic release. "Very little change could be made," replied Mr. Trenholm. "Certainly the railways cannot run their trains to suit the engineer and fireman. They must run them to suit the public. The engineer adopted his profession fully realizing the conditions, and there is no condition which warrants guaranteed pay, a five-hour day, an arbitrary payment before the day's work, another after and others in between. I don't believe there is any demand in the commercial world today for a rule that says five hours or less is a day. They don't even guarantee that. They simply guarantee to come out when called and work a little bit and then they demand arbitrariness."

#### "PRODUCTIVE EFFICIENCY"

Mr. Stone tried to show that increased train loads increase the earnings of the railways, and the so-called "productive efficiency" of the men. Mr. Trenholm maintained the only

result was a saving in the handling of the business at hand.

"In this western country," said he, "if it had not been for the money put into railways for reduction of grades, elimination of curves, increasing car capacity, and larger engines able to handle greater tonnage, I think 75 per cent of the western roads would have been bankrupt. The roads could not live under conditions of 15 or 20 years ago. The little engine, little car and little trainload could not exist. Under the pressure that has been on the railways to reduce rates and make improvements required by state and federal laws, if it had not been for the resourcefulness of railroad men, bringing to bear every possible means of curtailing expenses, I think I am safe in saying 75 or 80 per cent of the roads today would be bankrupt. There never was a time when railway operation was more closely watched to reduce expenses than it is today."

Mr. Nagel asked whether the time and a half for overtime rule, in his opinion, would afford any stronger inducement to a railroad to avoid overtime than present conditions. "No," replied the witness, "and I believe the only thing that could be done to avoid that extreme penalty would be to change your terminals and revolutionize train operations."

Mr. Stone asked Mr. Trenholm if the engineer was not the most responsible man on a railroad.

"No, I don't think so," replied Mr. Trenholm. "There are lots of men on the railroad who are more responsible than he is, the road masters and train masters, train dispatchers, superintendents and assistant superintendents. All the minor officials on a railroad work twice the hours he works. There is no time in the 24 hours they are not subject to call."

Mr. Stone said: "You could give the whole class named a holiday for a week and the railroad would run right ahead if the engineers kept working."

"No, it won't," said Mr. Trenholm, "the engineer would not run very far without the train dispatcher."

In discussing the amount of time a man should work during a day, Mr. Trenholm said that he put an order in effect on his road years before the hours of service law went into effect, limiting men to 16 hours, and that he has been considering very seriously for two years putting in another order limiting them to 14 hours.

#### ACTUAL EARNINGS OF TYPICAL MEN FOR ONE YEAR

After the cross-examination on his earlier testimony Mr. Trenholm introduced an exhibit giving payroll figures for 9,030 men for the year ending June 30, 1914. "To get a true picture of the actual results under present conditions," he said, "each railway was asked to give the earnings for the year of one man in each pool or group in which the men divide among themselves in turns the work on one run. For each is shown the number of men, whether 2, 3, 5, 10 or 20, of which he is thus representative. If one man earns the amount shown each of the others in that pool could have earned the same by working his assigned time." The exhibit showed the yearly earnings of 3,230 engineers and 5,800 firemen, together with the name, location, number of miles made and time worked. As only a partial list Mr. Trenholm pointed out by name 11 engineers who are earning over \$3,000 per year, with a maximum of \$3,725.20, and a partial list of six firemen who are making from \$1,800 to \$2,061 a year. There were many more men in the same pools, said Mr. Trenholm, who had the opportunity to earn as much, or more than these men.

President Carter of the Firemen's organization objected to the introduction of the exhibit, on the ground that the earnings shown were not representative. "We realize our case is lost if we take the exhibits of the railroads too seriously," he said. "They do not represent what they purport to." For a time it appeared that the payrolls for all of the roads would have to be shipped to Chicago to satisfy him, but Mr. Trenholm showed that the figures given for each man were typical of the others in the same service.



Mr. Trenholm concluded his direct testimony on Monday, March 1, by presenting a summary of the previous exhibit. The summary showed for the 9,030 men the number of months the men worked in each assignment, the total number of trips, the total miles, hours on duty, hours per trip, lost time, total wages of the assignment, wages per hour, wages earned outside of the assignment and the total wages. The average miles, hours and wages for each class of service are shown in the following table:

	Average miles per trip	Average hours per trip	Average wages per hour
<b>Engineers—</b>			
Passenger .....	133	5.5	\$1.13
Through freight .....	117	9.5	.70
Local or way freight .....	93	11.6	.59
Pool or chain gang .....	110	9.5	.70
Branch passenger .....	85	4.7	.86
Branch freight .....	74	9.5	.61
Mixed .....	47	5.5	.61
Suburban .....	28	2.4	.72
All engineers .....	96	7.2	.76
<b>Firemen—</b>			
Passenger .....	132	5.4	\$0.72
Through freight .....	116	9.4	.46
Local or way freight .....	91	11.4	.38
Pool or chain gang .....	110	9.6	.46
Branch passenger .....	82	4.6	.52
Branch freight .....	69	9.2	.39
Mixed .....	45	5.3	.38
Suburban .....	31	2.3	.46
All firemen .....	93	7.0	.48

This concluded the direct testimony of the railways and rebuttal testimony on behalf of the two brotherhoods was begun by W. J. Lauck, statistician for the two brotherhoods.

## RETAINING WALLS ON SOFT FOUNDATIONS\*

BY W. S. LACHER

Office Engineer, Chicago, Milwaukee & St. Paul, Chicago.

The Chicago, Milwaukee & St. Paul is now engaged in elevating its tracks in the city of Milwaukee between the Kinnickinnic and the Menominee rivers, a distance of about 1½ miles. When this portion of the road was built in 1871, about two-thirds of it was placed on a pile bridge because the ground surface at that time was but little above the level of Lake Michigan and was virtually a marsh. Since that time, this trestle has been entirely filled in, as has also the surrounding property, much of which has been improved with buildings of various kinds. The tracks have settled greatly since the filling was done, but as settlement has occurred, additional material has been placed under the tracks so that the original elevation has been

depth. The tests showed beyond question that piles would have to be driven into this gravelly material to be at all reliable. Owing to a lack of sufficient number of drivers with leads long enough to handle 75 and 80-ft. piles, it was evident that many piles would have to be driven in two sections and connected by splices. Taking into consideration the results of pile tests, the great length of piles and the necessity for splices it was concluded to limit the load per pile to 15 tons.

A mass concrete retaining wall on a pile foundation such as shown at "a" in Fig. 1, would prove very expensive under such conditions. This naturally led to speculation as to the possible use of walls on natural foundations under such unfavorable conditions. Many types of walls in mass and reinforced concrete were investigated, but most of them were eliminated either because they gave too great a variation in the toe and heel pressure under the various cases of loading or else they were not capable of withstanding the large settlement anticipated without possibility of serious damage. The only common design that seemed to approach the solution was the mass wall marked "b," or its equivalent "c" in Fig. 1, of reinforced concrete. The advantage in cost is apparently with the former. As the possible source of a solution it was suggested by C. F. Loweth, chief engineer, that studies be made to ascertain the feasibility of adapting either the timber crib or the dry stone wall to plain or reinforced concrete.

The dry wall was the first to be studied. A dry wall is inclined at such a slope that the resistance line will fall at the center line of the wall or behind it at all points in its height. The most primitive form for such a wall is shown at "d," Fig. 1. This has the joint placed very nearly at right angles to the resistance line but it obviously involves difficulties in construction which would make it prohibitive. A modification of this design is shown at "e," which is simply a slab of concrete leaning against the embankment. This slab could be built in place or cast in short sections and erected at a convenient time. In either event it would be necessary to provide struts of timber or concrete to support the wall until the embankment could be placed.

In the design marked "f," Fig. 1, is shown a form intended primarily to get a cheap construction. It consists of a tier of blocks with horizontal beds stepped back to give the desired slope. To avoid the necessity for erecting these walls in short sections during the placing of the embankment they can be provided with ribs extending back into the fill at intervals of about 9 ft. This portion of the wall serves simply as a support until the embankment has been placed and is not intended to add to

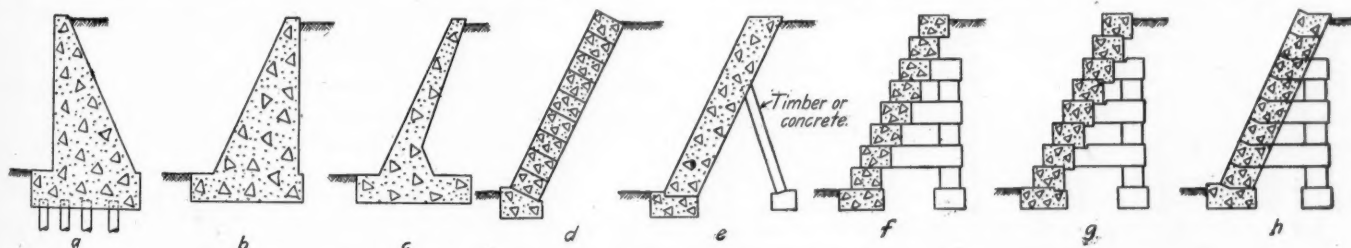


Fig. 1—Various Types of Retaining Walls Considered for Use on Soft Foundations

maintained. Many of the buildings in the vicinity, however, show evidence of unusual settlement.

Because of the uncertain conditions, foundation investigations were made; test piles being driven to a depth of 80 ft. and test borings carried to a depth of over 100 ft. These investigations showed a deposit of filled material from 10 to 15 ft. deep immediately below the surface, consisting of gravel and sand under the main tracks and refuse of various kinds under side tracks and unoccupied portions of the right of way. Below this, to a depth approaching 80 ft. there are numerous though rather poorly defined strata of wet, slimy clay and fine sand, below which is a bed of coarse sand and gravel to an unknown

the stability of the wall against lateral pressure. The weakness of this design is that the resultant pressure at each joint is inclined at rather an oblique angle with the horizontal, approaching much too close to the angle of friction of concrete upon concrete. This naturally suggests the use of a mechanical lock or bond between the blocks, such as would be secured, for example, by corrugating the surfaces of the blocks by casting them in forms lined with corrugated iron or by casting a lug on the bottom of each block as shown in "g," Fig. 1. The scheme illustrated at "h" is a combination of "d" and "g" in that part of the joint is horizontal, while the forward portion is inclined at an angle even greater than the perpendicular to the resistance line. By this means the desired resistance to sliding is obtained without sacrificing anything in the ease of erection. The forms

\*Abstract of paper presented before the Western Society of Engineers on February 8, 1915.

are somewhat more complicated, but this is not of great importance if any considerable number of the blocks are to be cast.

The equivalent of a timber crib in reinforced concrete is not, as it might seem at first thought, a combination of various shaped concrete sticks dovetailed or doweled together, but it is a box or series of boxes of reinforced concrete built with not less than one cell complete in one piece. The walls are of such a thickness as to compromise considerations of strength, economy and ease of construction. Concrete cribs have been used for some time by the war department in the construction of breakwaters on the Great Lakes, but in this adaptation they do not act as retaining walls, but as receptacles for stone. Two forms of concrete cribs are shown in Fig. 2. The first is simply a bottomless box which depends for its stability upon its own weight and the weight of the embankment superimposed on the portions buried in the fill. This type of wall has a large factor of safety in the passive resistance of the earth on the inside face of the rear wall, which becomes effective as soon as the wall starts to move forward. The wall also affords great frictional resistance to overturning. Neither of these elements ought to be considered in making an analysis for design, however. For a narrow right of way a natural modification from this crib wall is shown at the right in Fig. 2. This is in reality an application of the reinforced concrete filled "u" abutment. The lateral forces are taken care of entirely within the structure and only the vertical loads are transmitted to the foundation.

As a necessary preliminary to the analysis of the types of walls described, the applicability of the theory and constants commonly used in dealing with the lateral pressure of earth was investigated. As the use of common factors in the analysis of trial designs of the block wall proved that small variations in the factors resulted in great variations in the position of the resistance lines, authority was obtained to build and test a model wall of the concrete block type. This wall was one-fourth as

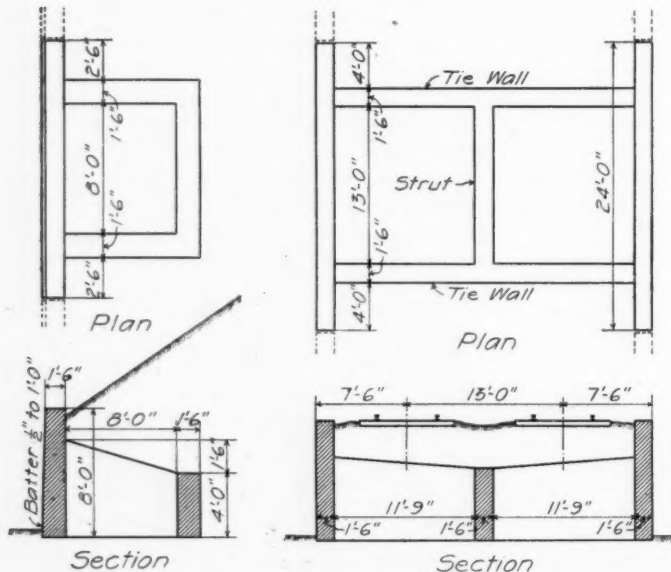


Fig. 2—Unsymmetrical and Symmetrical Cellular Retaining Walls

high as a full-sized wall for a 17-ft. embankment and was 12 ft. long between bulkheads. It was backed with a sand embankment and tested with a live load of pig iron piled on wooden cross-ties 2 ft. long. The tests indicated that the live load spread is much greater than had been supposed, and further pointed out a fertile field for extensive investigation. As to the design of a block wall, the tests proved clearly that horizontal beds without bond or lock give the wall a low efficiency, as failure by sliding will take place at loads much below those required to cause overturning. With a properly designed joint, such as that shown in "h," Fig. 1, the block wall presents advantages under certain circumstances that justify its serious consideration.

Fig. 3 shows diagrammatically the relative cost of the mass wall with a heavy front batter on natural foundations, the block wall, the cellular wall and the mass wall on piles. This comparison is based on the assumption of very expensive piles, such as are required on the work at Milwaukee. The relative economy of the types, excluding all other considerations, is directly in the order named above. A consideration of these types, however, shows the following advantages and disadvantages:

The block wall in addition to its economy can settle in an irregular manner without making it conspicuous, it can be constructed in several stages and it does not occupy much space before filling. On the other hand the heavy front batter causes a waste of property which will encourage encroachment and unless built with a smooth batter will encourage trespass-

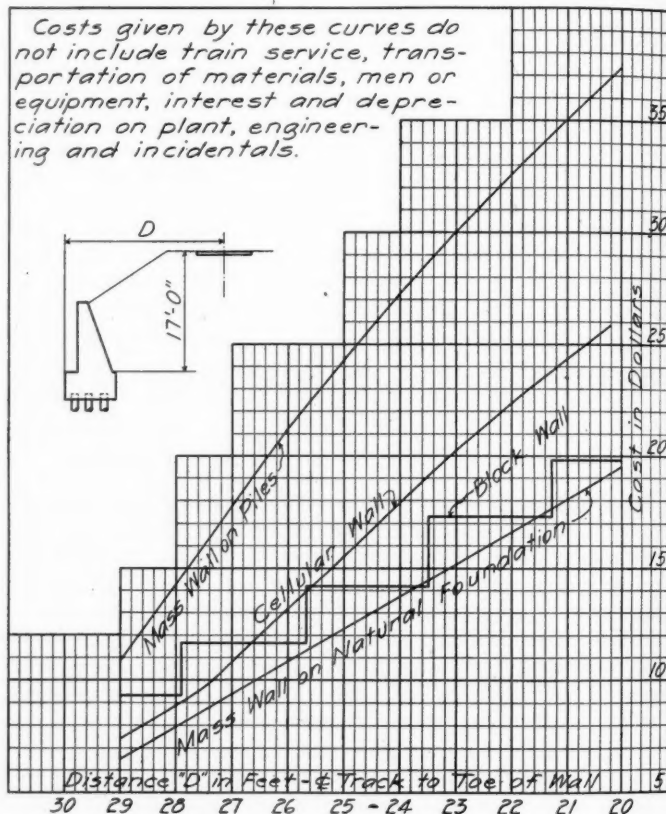


Fig. 3—Comparative Costs of Four Types of Retaining Walls on Soft Foundations

ing. Because of its loose-jointed nature the block wall does not possess as much of a potential factor of safety against unforeseen contingencies under some circumstances as a monolithic structure.

The heavy batter mass wall is economical, but will cause criticism if it settles or tips appreciably, and is subject to the same objections as the block wall on account of the heavy front batter. The cellular wall affords little opportunity for encroachment; it may settle considerably but offers great resistance to overturning or sliding, and it permits of ready driving of piles for a trestle directly over it. It possesses the disadvantages of occupying considerable space before filling, which may interfere with the use of the tracks and settlement may also give it an unpleasing appearance. The mass wall on piles gives maximum security, but is expensive and may lead to difficulties through possible damage to adjacent buildings on insecure foundations as a result of pile driving. This consideration was given much weight in the search for a substitute for the structure on piles.

Up to the present time one block wall with corrugated horizontal beds and two cellular walls have been built at Milwaukee. Plans have been prepared for the use of a cellular wall at a number of other places on this work. This type of wall has



been favored on account of the fuller utilization of the right of way and also in a number of instances because of the necessity for driving pile trestles for adjacent industry tracks directly over the wall.

### THE PANAMA RAILROAD STEAMSHIP LINE

In the review of the annual report of the Panama Railroad Company given in the editorial columns of this paper in the issue of February 26, something was said relative to the earnings of the company's steamship line. The following comments taken from a letter written to Senator Root in connection with the debate on the Ship Purchase Bill by Edgar F. Luckenbach, a prominent ship owner, will perhaps also be of interest. The letter points out that the annual reports of the Panama Railroad Company for 1911, 1912, 1913 and 1914 give the following earnings for the steamship line:

Year	Profit	Year	Profit
1911.....	*\$77,187.97	1913.....	\$221,489.92
1912.....	†305,742.85	1914.....	314,296.36
		Total.....	\$612,974.25

\*1912 report. †Loss.

"The steamship company owns the steamers Allianca, with a book value of \$518,865.87, and the Advance, book value \$221,186.30, or a total of \$740,052.17. They also operate the steamers Ancon, Cristobal, Panama and Colon, which are worth about \$600,000 each.

"These last four named vessels are loaned to the Panama Steamship Company by the Panama Canal Commission free of charter hire, insurance, depreciation or interest charges, and no one could operate these vessels unless they paid at least the following charges (investment of \$2,400,000 for four years): Interest at 6 per cent, \$576,000; insurance at 6 per cent, \$576,000; depreciation at 6 per cent (which is the rate allowed by the Panama Steamship Company on other vessel property they own), \$576,000; insurance on freight moneys, \$22,439.28, and insurance against loss and damage to cargo (known as protection and indemnity), \$6,000, making a total of \$1,756,439.28.

"You will find in the annual report for 1914, page 47, no insurance charges are made on the steamers Allianca and Advance, which are valued at \$740,052.17. Added to above: Hull insurance at 6 per cent, \$177,612.52; cargo insurance, \$2,000; interest at 6 per cent, \$177,612.52; total \$2,113,664.32.

"If any one else were operating these vessels to protect themselves properly they would have to pay the above enumerated charges, showing a loss for four years of \$1,806,432.92.

"Ordinarily the above named steamers would be worth, on time charter basis, about \$10,000 per month. (If I could get them today I would be willing to pay \$20,000 per month.) Figured on the basis of \$10,000 per month for each steamer for four years, the loss would be much larger than the figures given above, or on this basis the loss would be \$1,920,000."

### FLASH LIGHT SIGNALS ON THE BOSTON & MAINE

The Boston & Maine, which has used flashing acetylene lamps on signals experimentally for nearly two years, now has these lamps in use on about ten miles of its line, from Parkway Bridge, Mass., to Reading Highlands, on the Portland division. This is a double track line and there are thirty-six block sections, a home and a distant arm on each post. Both arms have the flash lights, and they flash from 58 to 62 times a minute. The signals at interlockings have ordinary steady lights, so that enginemen are able quickly to distinguish automatic from non-automatic signals.

The flash lights are furnished by the Commercial Acetylene Railway Light & Signal Company, New York City. By an automatic regulator in the pipe supplying gas to the lamp, the gas is made to flow only one-tenth of the time, making each lamp glow, for example, one-tenth of a second and then remaining dark nine-tenths of a second.

The night signals on the Boston & Maine show white for proceed, red for stop and green for caution.

Steady acetylene lamps have been used on several hundred block signals on the Boston & Maine for several years past.

The Norfolk & Western has had one of the flash lights in use on an automatic signal for the past eight months and reports the lamp as not only very reliable, but as costing much less than an oil lamp for the same service. On both this road and the Boston & Maine the enginemen are reported as much pleased with the flash light.

### THE LOUISVILLE & NASHVILLE INVESTIGATION

The Interstate Commerce Commission on February 25 sent to the Senate its report on the investigation of the finances, rates and practices of the Louisville & Nashville. This investigation, authorized last spring by a resolution introduced by Senator Lea, of Tennessee, was directed mainly to discover whether the Louisville & Nashville, through control of the Nashville, Chattanooga & St. Louis and smaller lines, had restrained competition in the territory served by those roads, whether the control of the Louisville & Nashville by the Atlantic Coast Line, operated to the same end, and what amounts of money the Louisville & Nashville has contributed to political activities and other efforts to fight competition.

The report says that the Louisville & Nashville acquired competing lines and for years carried on an elaborate political and publicity campaign to eliminate competition and influence public opinion at enormous expense. The commission, however, qualifies its general charges of extravagance and of wrongful expenditures by the statement that the road had to meet much strong competition.

The commission from its investigation concludes that at least \$16,000,000 shown in the Louisville & Nashville's cost of road accounts covers items which should not be charged to them. These charges are as follows:

CHARGES INCLUDED IN COST OF ROAD ACCOUNTS BUT NOT EXPENDED FOR ACTUAL CONSTRUCTION	
Discount on stock.....	\$1,440,018
Other expenses in connection with the sale of stock.....	32,671
Discount on bonds.....	2,192,143
Other expenses in connection with the sale of bonds.....	8,538
Interest and dividends.....	1,917,535
Amounts credited to profit and loss:	
For reasons not stated.....	\$2,640,000
To provide a surplus in order that a stock dividend of 100 per cent might be paid.....	6,300,000
To raise book value of stock above the actual cost of acquirement.....	1,422,784
To adjust difference between advances made for construction and par value of bonds received in settlement therefor.....	78,448
	<hr/> 10,441,232
	\$16,032,137

The commission says: "The above statement is illustrative of the character of charges which the carrier has included in its cost of road account. A full examination of the carrier's accounts might disclose conditions under which some of the above amounts could properly be charged to cost of road account, but it is also possible that other improper items would be found which would greatly augment the amount shown."

The Louisville & Nashville now owns 71.77 per cent of the capital stock of the Nashville, Chattanooga & St. Louis, and it appears that this control was obtained primarily for the purpose of restraining competition. This opinion is thought to be borne out by statements taken from the annual reports of the Nashville, Chattanooga & St. Louis for 1872 and 1880, respectively. It is also thought that the geographical relations of the two systems are such that were they separately controlled competition between them would be the inevitable result. The two roads further have made traffic agreements which result in restraining competition.

The Louisville & Nashville, chiefly since 1880, has acquired a controlling interest in over 100 other railroads. While one of the purposes of the Louisville & Nashville has obviously been to

restrain competition in the territory which it serves, there is no doubt that several of its subsidiary lines were acquired not so much to restrain competition as to meet competition. Although the Louisville & Nashville has to a large extent a monopoly of local business in its territory, on through business it is in active competition with the Southern, the Illinois Central, and other large systems. These rival systems have, since about 1880, been aiming, by securing control over branch and connecting lines, to expand and perfect their control over their respective spheres of influence. Among the roads of which the Louisville & Nashville has acquired control are the Nashville & Decatur, the Tennessee Midland, the Paducah, Tennessee & Alabama, the Chesapeake, Ohio & Southwestern, the Georgia Railroad, the Atlanta & West Point, the Western of Alabama, the New Orleans, Mobile & Chicago, the Kentucky Central and the St. Louis & Southeastern.

The report also attempts to show that the Louisville & Nashville has tried to restrain competition on the Cumberland and Tennessee rivers by means of its control of terminal facilities at Nashville, Knoxville and Clarksville. It has also tried to restrain competition in various ways on the Alabama, Green and Barren rivers.

The Louisville & Nashville, although serving New Orleans and Mobile, has been primarily interested in Pensacola, and has a fixed policy of attempting to prevent traffic movement through the other ports. It, for example, has not tried to develop its terminals at New Orleans. It has tried to hinder the movement of traffic through Mobile by restricting the issuance of through bills of lading on export cotton for Mobile. On the other hand, in conjunction with the Gulf Transit Company it has solicited traffic through Pensacola, although its terminals at that port are not good. The commission states its intention of taking this up further in its investigation of conditions at these ports in connection with the Panama canal act.

The Atlantic Coast Line Company, a holding company, owns no stock in the Louisville & Nashville. The Atlantic Coast Line Railroad Company, however, owns \$36,720,000, or 51 per cent, of the \$71,917,920, par value, of capital stock of the Louisville & Nashville outstanding on June 30, 1914. Prior to March 10, 1914, the Atlantic Coast Line Company, through ownership of a controlling interest in the capital stock of the Atlantic Coast Line Railroad Company, did indirectly control the Louisville & Nashville. Control of this holding company over the Louisville & Nashville was relinquished just after this investigation was begun, and presumably as a result of it. The same interests, however, appear still to control both the Louisville & Nashville and the Atlantic Coast Line railroad companies. Henry Walters, Michael Jenkins and Waldo Newcomer held or controlled 115,658 shares of the Atlantic Coast Line Railroad Company's common stock, and practically controlled the Atlantic Coast Line and the roads controlled by it, including the Louisville & Nashville. The commission's investigation did not disclose any arrangement to control traffic, however.

In connection with the Tennessee Railroad Association, formed by carriers in 1884 to combat adverse legislation in that state, the report says:

"The various payments made on account of the Tennessee Railroad Association by the Nashville, Chattanooga & St. Louis and the Louisville & Nashville were to a large extent made to state officers and legislators of Tennessee, municipal officers of Nashville, politicians, lobbyists and attorneys. Investigation showed that payments made by the Nashville, Chattanooga & St. Louis in this connection, aggregating over \$20,000, could be definitely assigned to persons formerly or at present holding public office, but the total amount paid to such persons was no doubt much in excess of this sum."

The report also includes the following statements:

Payments aggregating \$82,596 for purposes mentioned in the resolution were made by the Louisville & Nashville between September 1, 1906, and July 1, 1914, and there were expenditures in the same period for maintaining political and legislative agents and associations of \$23,274.

For creating public sentiment in favor of the plans of the Louisville & Nashville in the same period \$59,322 was spent, of which \$53,000 was used in a publicity campaign in Alabama to mold public opinion through the press, and part of the balance contributed to a fund made up by carriers to finance a campaign in Louisiana to prevent the change of tax laws. In this connection, says the report, "to preserve an outward appearance of indifference the funds were placed in the hands of a bank to be disbursed by it as if in furtherance of banking interests."

The Louisville & Nashville paid to the Nashville, Chattanooga & St. Louis \$120,198 for the use of the Tennessee Railroad Association, in addition to other "large expenditures in connection with that association."

A large number of vouchers were issued by the Louisville & Nashville between 1906 and 1914 to various persons, concerning which the accounts gave no information other than that the expenditures were for "special" services. They amounted to about \$295,000. A request for files in the general manager's office bearing on these vouchers was denied, and other vouchers aggregating \$67,722 from 1906 to 1911 were issued under the direction of the legal or executive departments of the road without the purpose being stated. One of these vouchers was for more than \$20,000, and all were in excess of \$1,000. Whether such sums were spent for the purposes referred to by Congress, the commission could not determine.

An account was opened in the name of the Immigration and Industrial Association of Alabama in 1907. This records a cash advance to George W. Jones, assistant district attorney in Montgomery, Ala., made under authority of the first vice-president; \$13,069 was charged to this account; \$7,869 was recollected from other carriers who were parties to this association and credited to this account. The balance of \$5,200 remaining was charged to operating expenses by authority of the first vice-president. The nature of this account is indicated by notations on the treasurer's statements of cash receipts entered therein, such as "proportion of expenses, account adjourned session of the Alabama legislature."

A "suspense" account in the name of the National Bank of Commerce of Louisville was opened in June, 1911, to record the amounts of checks issued under authority of President Milton H. Smith, in favor of the bank, between June 7 and October 5, 1912. Amounts aggregating \$249,994 were paid to the bank in the form of such checks. No information could be obtained in regard to the purpose for which these payments were made. The report says that "under the accounting rules prescribed by the commission the keeping of such vague accounts at the present time would subject the carrier to prosecution."

"It could not be determined what the purpose of all these large unexplained expenditures was. It seems clear, however, that for some reason the officials who were responsible for these entries deemed it expedient to conceal not only in the original entry, but from those engaged in this investigation the real purpose for which these expenditures were made."

The accounts of the Nashville, Chattanooga & St. Louis disclose expenditures of \$13,137 from 1867 to 1914 in maintaining political or legislative agents and \$856 to create public sentiment. In addition to these items explained in the accounts the commission said it discovered other disbursements aggregating \$599,668, the purposes of which are concealed. Of this amount about \$233,000 was collected from other railroads.

From 1884 to 1907 carriers expended about \$560,000 in connection with the Tennessee Railroad Association, of which the net contribution of the Nashville, Chattanooga & St. Louis appears to have been about \$367,000. Entries in this account give little detail, but there are specific items for campaign subscriptions, special trains transporting legislative bodies over foreign lines, items for "legislative services" and large ones for "special expenses." These aggregate over \$300,000.

The commission also announces its intention of making a further investigation into the correspondence files of the carriers, but states that its "future action must depend on additional legislation affecting our powers." (33 I. C. C., 168.)



## General News Department

By permission of the court, the Receiver of the Buffalo & Susquehanna is to continue the operation of that road until April 1. This is the fifth extension of time since the bondholders first asked for delay last autumn.

The Cummins bill, requiring common carriers (including express companies) to pay full value for losses of or damages to freight for which they are responsible (making illegal all contracts to limit liability) has passed both Houses of Congress.

Members of the legislature of British Columbia in numbers sufficient to fill a special train, made an inspection trip over the Canadian Northern Pacific on February 12 from New Westminster to Cisco, 140 miles and back. T. H. White, chief engineer, acted as host.

A. W. Thompson, vice-president of the Baltimore & Ohio, was awarded a gold medal by the Engineers' Society of Western Pennsylvania at the annual meeting of the society on Monday evening, February 8, for the general excellence of his paper on the Magnolia cut-off, presented before that society recently.

The Southern Railway has just put in service 57 steel passenger cars, all electric-lighted. These cars have been assigned to eight of the most important through trains; and steel-frame cars heretofore used on these trains have been assigned to other through trains; and this in turn has released steel underframe cars for use in local trains. Seven steel dining cars have recently been put in service.

Aiming to protect its employees against permanent injury to the eye, the Baltimore & Ohio urges, in a circular issued recently, that in case of eye injury, or of foreign particles lodging in the eye, to secure the service of a company physician whenever possible. Railroad experience cites many cases of permanent injury to the eye or loss of sight as a result of inexperienced persons attempting to act in the capacity of surgeons.

Under the consolidated organization of the New York Central the clearing house at Buffalo is to be moved to Cleveland, taking over 200 employees away from Buffalo; but on the other hand the freight claim departments of the New York Central, at New York City, and of the Lake Shore, at Cleveland, are to be moved to Buffalo and consolidated. The number of new employees in Buffalo, therefore, will be about equal those who go away. The claims department will use about twice as much room as has been used by the clearing house.

The testing laboratory of the New York, New Haven & Hartford at New Haven, Conn., during the past year has made about 10,000 tests, the articles tested ranging all the way from pencils to piston rods and from milk to paint. Special attention has been given to sanitation on passenger trains, and the milk and cream for the dining cars have been kept at the highest standard. The physicists of the laboratory have made a large number of tests of air in passenger cars on trains, and a thorough system of sterilizing drinking water receptacles on trains has been established. The chemists have analyzed the water from each one of the wells on the company's premises.

A special engineering corps of 500 Canadian engineers is to be organized for service in the European war. A request was received some days ago from the War Office in England for the formation of such a body, whose duties it will be to rebuild bridges and tracks, and perform other work of this kind. Vice-President George Bury of the Canadian Pacific has, it is said, agreed to undertake the work of organization, as the railway is naturally in a better position to secure the right kind of men than the government would be. The heavier equipment for this corps will be supplied by the British War Office, but the smaller and lighter equipment will be provided in Canada and transported with the men.

Alfred Craven, chief engineer of the New York Public Service Commission, First district, has reported to the commission that with additional reinforcement, which will not cost more than

\$200,000, the Second Avenue elevated railroad in Manhattan will be strong enough for the operation of trains composed of the composite cars now used in the subway, which the Interborough Rapid Transit Company proposes to transfer to lighter trucks and to run on the elevated railroads. He is also of the opinion that the Third Avenue elevated railroad will be strong enough for these cars after the third-tracking work is completed, but suggests that he be allowed six months in which to complete his investigation and decide finally as to the Third Avenue structure.

W. T. Lechlides, superintendent of the Cleveland division of the Baltimore & Ohio, has issued a bulletin giving the names of about 100 employees who, during the last nine months, have participated in the "efficiency movement," started by Mr. Lechlides, designed particularly to show economy by gathering abandoned material along the roadway and sending it to storehouses. The results of this work have been noted from time to time in the *Railway Age Gazette*. The summary now issued shows four enginemen who picked up more than a hundred dollars' worth of material each, the man at the top of the list having been credited with \$313. At one station the office force secured a credit of \$52; from these larger amounts the list runs down to items of twenty-five cents each.

The safety department of the Delaware, Lackawanna & Western has issued Safety First Bulletin No. 10, giving a summary of accidents to Lackawanna employees for the years 1911, 1912, 1913 and 1914. The number of employees killed in 1911 was 70, and in 1912, 46; 1913, 45, and in 1914, only 26. The number of employees injured in 1911 was 2,319; in 1912, 2,318; in 1913, 2,092, and in 1914, 1,875. There has thus been a steady decrease year by year. Comparing 1914 with 1911, the decrease in the number of employees killed was 63 per cent, while the injured decreased 19 per cent. It has been decided to award a Safety First flag to the division making the best safety record in 1914, and subsequent years, and also one to the shop making the best record. For the year 1914, the Morris & Essex division was awarded the division flag and the Scranton-Keyser Valley shops were awarded the shop flag.

M. A. Dow, general safety agent of the New York Central Lines, is sending out to manufacturers owning plants adjacent to the company's property small printed slips on safety first to be put into the pay envelopes of employees. The statement begins by saying that the railroad company has called the manufacturers' attention to the risk incurred by the employees of the factory who walk on the tracks; and, after briefly explaining the general situation, it ends with the injunction that "the practice of walking the railroad tracks by our employees must be stopped at once. The interests of personal safety require that strict observance of this rule must be enforced." Mr. Dow furnishes the slips printed in English, and also in other languages, as may be needed. Within a reasonable time after the notices have been supplied to a given factory, the inspectors of the railroad company make observations to see how well the advice has been carried out; and if track walking continues officers are sent to make some arrests.

### Confidential Letters Called For

George Bury, vice-president of the Canadian Pacific, has sent to all the employees of the company the following letter:

"By the president's direction you are invited to send at any time to C. H. Buell, secretary of the Pension Department, suggestions looking to continued amicable relations with the public; improving the conditions of employment, and increased efficiency of our operations. It is believed that there is much talent in such a vast organization as ours that never has had an opportunity of coming to the front. . . . Letters will be treated as confidential and will be passed upon periodically by a committee, so that anything of worth may be fully recognized. The object is to obtain the benefit of the ideas of those working

with us, and not a means for airing grievances, which, if they exist, should go through the usual channels. . . ."

#### Increased Cost of Passenger Trains

In connection with the campaign of the Illinois railroads for an increase in passenger fares in the state from 2 to 2½ cents a mile the railroads have given out a statement by an operating officer of the Illinois Central, showing the increased cost of operating passenger trains, in which the actual cost of the cars and engines of one of the Illinois Central's best trains today as compared with its cost 12 years ago is itemized as follows:

Actual cost	1903	1915
Locomotive .....	\$16,638	\$23,135
Chair car .....	9,393	11,580
Parlor car .....	14,343	17,019
Dining car .....	14,550	20,227
Coach .....	9,195	12,369
Baggage car .....	5,048	11,165
Mail car .....	7,729	16,901
Cafe car .....	11,000	18,381
Total .....	\$87,895	\$130,797

"But \$130,000 doesn't represent even half of the cost of our 'Daylight Special' trains," continued the statement. "One train leaves Chicago about the time its counterpart leaves St. Louis, so we have to have two complete trains, except as to engines, of which four are required.

"The total cost of the equipment alone of our 'Daylight Special' is therefore \$307,864."

#### Summary of Revenues and Expenses of Large Steam Roads

The following figures were compiled by the Interstate Commerce Commission from monthly reports of operating revenues and expenses of large steam roads for the month of December, 1914. No reports are included for railroads whose operating revenues for the year ended June 30, 1914, did not reach \$1,000,000.

The figures are compiled as rendered and should not be considered final, inasmuch as scrutiny of the reports may lead to their modification before acceptance.

Item	FOR THE MONTH OF DECEMBER											
	United States			Eastern District			Southern District			Western District		
	Amount	Per mile of road operated		Amount	Per mile of road operated		Amount	Per mile of road operated		Amount	Per mile of road operated	
		1914	1913		1914	1913		1914	1913		1914	1913
Average number of miles operated	228,604.15	...	...	58,788.27	...	...	42,317.60	...	...	127,498.22	...	...
Revenues:												
Freight .....	\$154,497,821	\$676	\$753	\$65,554,165	\$1,115	\$1,276	\$24,759,713	\$585	\$707	\$64,183,943	\$503	\$523
Passenger .....	49,858,799	218	257	21,389,576	364	404	7,402,799	175	228	21,066,424	165	198
Mail .....	4,778,518	21	20	1,731,171	29	29	627,147	15	15	2,420,200	19	17
Express .....	6,168,113	27	32	2,719,832	46	55	1,035,209	24	30	2,413,072	19	22
All other transportation .....	6,224,741	27	30	3,468,906	59	62	494,570	12	14	2,261,265	18	20
Incidental .....	4,631,659	20	21	2,441,131	42	42	617,754	15	16	1,572,774	12	14
Joint Facility—Cr. ....	257,551	1	1	113,839	2	2	55,161	1	1	88,551	1	1
Joint Facility—Dr. ....	98,463	...	...	60,525	1	1	11,727	...	...	26,211	...	...
Railway operating revenues .....	\$226,318,739	\$990	*\$1,116	\$97,358,095	\$1,656	\$1,878	\$34,980,626	\$827	\$1,011	\$93,980,018	\$737	\$795
Expenses:												
Maint. of way and structures ...	\$25,442,409	\$111	\$134	\$11,403,481	\$194	\$227	\$4,097,949	\$97	\$119	\$9,940,979	\$78	\$95
Maintenance of equipment .....	40,452,117	177	197	19,455,571	331	372	6,299,876	149	178	14,696,670	115	122
Traffic .....	4,944,760	22	23	1,896,926	32	36	940,670	22	22	2,107,164	17	18
Transportation .....	87,872,802	385	427	40,764,318	694	779	12,469,165	295	344	34,639,319	271	290
Miscellaneous operations .....	1,815,854	8	10	878,017	15	16	175,850	4	5	761,987	6	8
General .....	6,452,940	28	30	2,832,723	48	49	1,015,503	24	26	2,604,714	20	22
Transportat'n for Investm't—Cr. ....	496,166	2	1	62,635	1	...	133,289	3	...	300,242	2	1
Railway operating expenses .....	\$166,484,716	\$729	†\$821	\$77,168,401	\$1,313	\$1,483	\$24,865,724	\$588	\$694	\$64,450,591	\$505	\$554
Net revenue from railway operations .....	\$59,834,023	\$261	\$295	\$20,189,694	\$343	\$395	\$10,114,902	\$239	\$317	\$29,529,427	\$232	\$241
Railway tax accruals .....	\$10,090,035	\$44	\$50	\$3,895,764	\$66	\$77	\$1,500,394	\$36	\$39	\$4,693,877	\$37	\$41
Uncollectible railway revenues .....	46,884	...	...	16,218	...	...	6,544	...	...	24,122	...	...
Railway operating income .....	\$49,697,104	\$217	\$245	\$16,277,712	\$277	\$318	\$8,607,964	\$203	\$278	\$24,811,428	\$195	\$200

\* Includes \$2 unclassified.

† Includes \$1 unclassified.

‡ Includes \$9 unclassified.

§ Includes \$4 unclassified.

Item	FOR THE SIX MONTHS ENDING WITH DECEMBER											
	1914	1914	1913	1914	1914	1913	1914	1914	1913	1914	1914	1913
Average number of miles operated	228,223.48	...	...	58,751.01	...	...	42,276.42	...	...	127,196.05	...	...
Revenues:												
Freight .....	\$1,037,721,176	\$4,547	\$4,954	\$447,298,470	\$7,613	\$8,378	\$153,692,772	\$3,635	\$4,097	\$436,729,934	\$3,434	\$3,638
Passenger .....	343,709,492	1,506	1,680	151,915,735	2,586	2,807	46,050,879	1,089	1,250	145,742,878	1,146	1,297
Mail .....	28,563,355	125	119	10,394,193	177	174	3,762,534	89	88	14,406,628	113	103
Express .....	35,183,628	154	175	15,776,156	268	310	5,246,594	124	137	14,160,878	111	125
All other transportation .....	43,089,972	189	202	24,075,788	410	421	3,388,870	80	92	15,625,314	123	135
Incidental .....	30,266,092	133	141	15,837,456	270	277	3,532,367	84	94	10,896,269	85	95
Joint Facility—Cr. ....	1,819,218	8	8	825,413	14	13	349,647	8	8	644,158	5	6
Joint Facility—Dr. ....	642,820	3	3	409,535	7	6	76,209	1	1	157,076	1	1
Railway operating revenues .....	\$1,519,710,113	\$6,659	*\$7,288	\$665,713,676	\$11,331	\$12,417	\$215,947,454	\$5,108	\$5,765	\$638,048,983	\$5,016	\$5,398
Expenses:												
Maint. of way and structures ...	\$192,792,096	\$845	\$972	\$80,990,433	\$1,379	\$1,651	\$30,114,211	\$712	\$778	\$81,687,452	\$642	\$718
Maintenance of equipment .....	357,010,142	1,126	1,229	119,924,293	2,041	2,282	42,372,690	1,002	1,074	94,713,159	745	789
Traffic .....	29,664,889	130	144	11,273,573	192	223	5,632,441	133	132	12,758,875	100	110
Transportation .....	524,684,080	2,299	2,530	243,962,596	4,152	4,620	75,120,381	1,777	1,952	205,601,108	1,616	1,746
Miscellaneous operations .....	11,872,666	52	59	5,579,241	95	99	1,079,251	26	28	5,214,074	41	50
General .....	36,884,718	162	165	15,625,286	266	265	5,977,653	141	144	15,281,779	120	125
Transportat'n for Investm't—Cr. ....	3,630,953	16	9	347,596	6	...	689,441	16	2	2,593,916	20	14
Railway operating expenses .....	\$1,049,277,638	\$4,598	†\$5,097	\$477,007,826	\$8,119	\$9,163	\$159,607,286	\$3,775	\$4,106	\$412,662,526	\$3,244	\$3,524
Net revenue from railway operations .....	\$470,432,475	\$2,061	\$2,191	\$188,705,850	\$3,212	\$3,249	\$56,340,168	\$1,333	\$1,659	\$225,386,457	\$1,772	\$1,874
Railway tax accruals .....	\$66,869,577	\$293	\$300	\$27,336,705	\$465	\$481	\$9,295,143	\$220	\$222	\$30,237,729	\$238	\$242
Uncollectible railway revenues .....	249,351	1	...	96,414	2	...	38,882	1	...	114,055	1	...
Railway operating income .....	\$403,313,547	\$1,767	\$1,891	\$161,272,731	\$2,745	\$2,768	\$47,006,143	\$1,112	\$1,437	\$195,034,673	\$1,533	\$1,632

\* Includes \$12 unclassified.

† Includes \$7 unclassified.

‡ Includes \$43 unclassified.

§ Includes \$28 unclassified.



### The Pennsylvania's Safety Record

The passenger record of the Pennsylvania Railroad for the year ending December 31 last, in which the trains of the company carried 189,000,000 passengers, with none killed in a train accident, which already has been noticed in the *Railway Age Gazette*, is the subject of a sixteen-page leaflet recently issued by Vice-President W. W. Atterbury and General Manager S. C. Long, congratulating the subordinate officers and the employees on this excellent record, and commending them for their part in producing it. The leaflet is filled mainly with reprints of editorial notices which have been clipped from newspapers in all parts of the country. Mr. Atterbury, in his letter, says: "Every man in the service had an important part in making 1914 a year free from accidents to passengers, and I want each one to know just what the public thinks of his work. It is only by pleasing the public that we can gain its friendship. Unless that part of the public that is dependent upon the Pennsylvania Railroad feels that our officers and employees are exerting all their efforts toward rendering the best and safest service the art of railroading makes possible, we cannot hope for the public's support in working out the many problems with which we are continually confronted."

### Proposed Railway Legislation

A bill to increase the legal passenger fare in Ohio from 2 to 2½ cents a mile has been introduced in the lower House of the Ohio legislature.

A committee of employees of the St. Louis & San Francisco, in Oklahoma, are said to have secured over 25,000 signatures to a petition to the legislature, asking for a restoration of the three-cent passenger fare.

Senator Newlands has introduced in Congress a bill to empower the Interstate Commerce Commission to examine all papers of a common carrier, including correspondence. The object of the bill is to change that provision of the Interstate Commerce law which was the subject of the recent decision of the Supreme Court in the Louisville & Nashville case.

The House of the Texas legislature has killed the bill to place all railroad hospitals in the state under the control of a board of seven men, five to be elected by employees and two by the roads. The committee on common carriers, in reporting the bill adversely, said that petitions had been received from more than 20,000 unorganized railroad employees and several thousand union employees protesting against the passage of the bill.

Among the bills before the Texas legislature is one requiring the abolition of highway grade crossings in all cities and towns of more than 5,000 population; and the committee of the House, which is investigating the subject, has been told by six of the leading roads of the state that to carry out the provisions of the bill will cost them two hundred and fifty millions. The Santa Fe, for example, runs through 76 counties in Texas, and to build one bridge each year in each county will cost \$2,250,000.

### MISSOURI

A delegation of members of the Business Men's League of St. Louis is planning to appear before the Missouri Public Service Commission and the Missouri legislature to urge an increase in the state passenger fare from 2 to 2½ cents a mile.

The bill to increase the passenger fare in the state to three cents a mile was made a special order in the lower House for Wednesday, March 3, and the railroad committees of both the House and the Senate have reported the bill favorably. The House bill would empower the state public service commission to fix a maximum rate of three cents a mile, and immediately to establish a 2½ cent rate. A committee of railroad employees, headed by four general chairmen of the conductors', trainmen's, engineers' and firemen's organizations, appeared before Governor Major of Missouri on February 23, to present arguments for increases in freight and passenger rates in the state.

Attorney General Barker of Missouri, at the request of the Senate of the Missouri legislature, has given an opinion that the Missouri Public Service Commission has the power to fix freight and passenger rates in the state, regardless of the statutory rate. The opinion was based on a decision of the Supreme Court of Missouri in the case of the Missouri Southern, in which it was

held that the act creating the commission, repealed the earlier law fixing passenger rates at two cents a mile and fixing maximum freight rates. The Attorney General said in his opinion: "I think it quite clear from the opinion, which was concurred in by the entire court, that the Public Service Commission has the power to increase the freight or passenger rates in excess of the maximum now provided by statute, if in the opinion of the commission such increase is necessary in order to furnish a fair return to the carrier."

### INDIANA

The Indiana Committee on Relations of Railway Operation to Legislation has given out a statement that bills introduced in the Indiana legislature, if enacted, would add about \$2,500,000 a year to the expense of the companies, while hampering transportation service. The bills against which the carriers are directing their opposition particularly are those to limit the length of freight trains to one-half mile and to require the railroads to employ telegraphers exclusively to handle train orders. The railroads say that the bill to limit the length of trains would burden them with an additional expense of at least \$2,000,000 a year, and would mean the slowing up of transportation service as the result of congestion. Industries requiring large supplies of cars would be hampered if the roads were prohibited by law handling a full quota to a plant in one train.

It is further pointed out that the roads would experience a heavy economic loss, as they would be prevented from deriving the benefit of improvements and betterments which have been made at a cost of \$150,000,000 to reduce grades and eliminate curves, and purchase larger engines.

It is also stated that it would cost the railroads of Indiana \$250,000 a year to comply with the provisions of the bill to compel the employment of telegraphers exclusively, to handle train orders. Advocates of the bill disclosed its principal purpose in a communication which has been distributed containing the caution that "under no consideration should any reference be made to the fact that the bill will provide more positions for telegraphers."

Charles B. Riley, secretary of the Indiana Grain Dealers' Association and the Indiana Millers' Association, has given out a statement on behalf of 600 firms, protesting against the bill to compel the railroads to limit the length of freight trains to one-half mile, on the ground that such a law would interfere seriously with the marketing of grain produced in the state. Having learned that members of the house of representatives prior to the passage of the measure by that body were given to understand that the shipping public favored the measure, Mr. Riley said, "it is a fact that few shippers could have entertained that view. Shippers more than any other class of railroad patrons benefit by the practices resulting in increased efficiency of equipment and prompt movement of tonnage. The grain dealers and millers of the state, with whom I am connected, and from whom I received instructions to enter a protest against this bill, are strongly opposed to it. It is the belief of the interests I represent that the railroads should be permitted, if not actually required, to haul in each train the largest possible number of cars, thus better utilizing their equipment in the service of the public."

Governor Ralston has sent a message to the legislature, recommending that the state public service commission be given authority to increase railroad passenger fares, if on investigation it finds the railroads entitled to the increase; and a bill has been introduced to carry out the recommendation.

### Profits in Pants

The Frisco Railroad is engaged in a campaign to psychologically popularize upper berths in the Pullmans. The agents will cease assuming that every passenger is going to insist on a lower, and will recommend the low price, the spring mattress, the roominess, the conveniences for hanging clothes and the other advantages to be had by buying an upper; and then the prospective passenger will imagine himself swayed to sleep on a spring mattress in an ideal temperature, and with his pants hanging safely on the conveniences provided, and containing the 20 per cent difference in cost between the upper and the lower berth.—*St. Louis Republic*.

### Railway Signal Association

C. C. Rosenberg, secretary of the Railway Signal Association, reports that all of the questions submitted to the members by letter ballot following the action of the last annual meeting have been decided affirmatively, except the proposed standard code of operated units which had been prepared for use in dividing the cost of joint mechanical interlocking plants; this was lost by a vote of 147 to 545.

The program for the discussions at the meeting in Chicago, March 15, includes reports from committees, 2, 3, 4, 6, 8 and 10, and the special committees on lightning protection and contracts. Committee No. 2 presents for discussion a code of specifications for electro-mechanical interlockings, filling 44 pages.

Committee No. 8, on electric railway and alternating current signaling, reports that it is bringing up to date the descriptions of alternating current signal installations which have been a feature of the proceedings of the association for two or three years past. Installations of this kind are increasing in number, and the committee expects to present a large amount of interesting matter at the next annual meeting.

Committee No. 10 presents a code of specifications, filling seven pages, for portable storage battery.

Committee No. 4 presents revised specifications for wood trunking and a revised code of circuit requisites for automatic block signaling on single track. These latter are a revision of those presented in the minority last September.

Committee No. 6 presents thirteen proposed standard drawings; and the special committee on lightning protection presents requisites for lightning arresters and choke coils.

The special committee on contracts, J. B. Latimer (C. B. & Q.) chairman, presents a simplified form of the table for operated units which was presented in September, but which failed to receive a favorable vote when put before the members in a letter ballot.

### Program of the American Railway Engineering Association Convention

The sixteenth annual convention of the American Railway Engineering Association will be held at the Congress Hotel, Chicago, March 16-19. Sessions will be held in the morning at 9 o'clock, and in the afternoon at 2 o'clock. The following is the program:

- Tuesday, March 16—  
 President's address.  
 Reports of secretary and treasurer.  
 Reports of the following standing and special committees.  
 Committee No. 12—Rules and organization.  
 Committee No. 10—Signals and interlocking.  
 Special committee—Uniform general contract forms.  
 Committee No. 9—Signs, fences and crossings.  
 Committee No. 16—Economics of railway location.  
 Committee No. 1—Roadway.  
 Committee No. 11—Records and accounts.  
 Wednesday, March 17—  
 Committee No. 3—Ties.  
 Committee No. 15—Iron and steel structures.  
 Committee No. 13—Water service.  
 Committee No. 5—Track.  
 Committee No. 6—Buildings.  
 Committee No. 17—Wood preservation.  
 Committee No. 19—Conservation of natural resources.  
 Special committee—Stresses in railroad track.  
 Annual dinner at 7 p. m.  
 Thursday, March 18—  
 Committee No. 8—Masonry.  
 Committee No. 7—Wooden bridges and trestles.  
 Special committee—Grading of lumber.  
 Committee No. 18—Electricity.  
 Committee No. 14—Yards and terminals.  
 Committee No. 2—Ballast.  
 Committee No. 4—Rail.  
 Election of officers.  
 Adjournment.  
 Friday, March 19—  
 Visit to the exhibit of the National Railway Appliances Association at the Coliseum.

### The Transportation Club of Louisville

At the regular annual meeting and election of the Transportation Club of Louisville held on February 9, 1915, the following officers were elected: President, F. G. Maus, division freight agent of the Pittsburgh, Cincinnati, Chicago & St. Louis; vice-presidents, F. N. Hartwell, H. Verhoeff & Co.; C. B. Phelps, general superintendent of transportation, Louisville & Nashville; Charles Van Overbeke, traffic manager, Standard Oil Company; secretary, S. J. McBridge, agent, Blue Ridge Despatch, and treasurer; W. T. Vandenburg, commercial agent, Seaboard Air Line.

### The American Society of Mechanical Engineers

The regular monthly meeting of the American Society of Mechanical Engineers will be held on Tuesday, March 9, in the Engineering Societies' building at 29 West Thirty-ninth street, New York. Dr. Hollis Godfrey, president of the Drexel Institute will present a paper on "The Application of Engineering Methods to the Problems of the Executive, Director and Trustee."

### MEETINGS AND CONVENTIONS

The following list gives names of secretaries, dates of next or regular meetings, and places of meeting.

- AIR BRAKE ASSOCIATION.—F. M. Nellis, 53 State St., Boston, Mass. Next convention, May 4-7, 1915, Hotel Sherman, Chicago.  
 AMERICAN ASSOCIATION OF DEMURRAGE OFFICERS.—A. G. Thomason, Demurrage Commissioner, 845 Old South Bldg., Boston, Mass. Annual convention, March 23, Jefferson Hotel, Richmond, Va.  
 AMERICAN ASSOCIATION OF DINING CAR SUPERINTENDENTS.—H. C. Boardman, D. L. & W., Hoboken, N. J. Next meeting, October 21-23, 1915, Boston, Mass.  
 AMERICAN ASSOCIATION OF FREIGHT AGENTS.—R. O. Wells, Illinois Central, East St. Louis, Ill. Annual meeting, May 21-24, 1915, Richmond, Va.  
 AMERICAN ASSOCIATION OF PASSENGER TRAFFIC OFFICERS.—W. C. Hope, C. R. R. of N. J., 143 Liberty St., New York. Next meeting, April 15-16, San Francisco, Cal.  
 AMERICAN ASSOCIATION OF RAILROAD SUPERINTENDENTS.—E. H. Harman, Room 101, Union Station, St. Louis, Mo. Next meeting, August 19-20, 1915, San Francisco, Cal.  
 AMERICAN ELECTRIC RAILWAY ASSOCIATION.—E. B. Burritt, 29 W. 39th St., New York. Annual convention, October 4-8, 1915, San Francisco, Cal.  
 AMERICAN ELECTRIC RAILWAY MANUFACTURERS' ASSOCIATION.—H. G. McConaughy, 165 Broadway, New York. Meetings with American Electric Railway Association.  
 AMERICAN RAILROAD MASTER TINNERS, COPPERSMITHS AND PIPEFITTERS' ASSOCIATION.—W. E. Jones, C. & N. W., 3814 Fulton St., Chicago. Annual meeting, Chicago.  
 AMERICAN RAILWAY ASSOCIATION.—W. F. Allen, 75 Church St., New York. Next session, May 19, 1915, Atlantic City, N. J.  
 AMERICAN RAILWAY BRIDGE AND BUILDING ASSOCIATION.—C. A. Lichty, C. & N. W., Chicago. Next convention, October 19-21, 1915, Detroit, Mich.  
 AMERICAN RAILWAY ENGINEERING ASSOCIATION.—E. H. Fritch, 900 S. Michigan Ave., Chicago. Next convention, March 16-18, 1915, Chicago.  
 AMERICAN RAILWAY MASTER MECHANICS' ASSOCIATION.—J. W. Taylor, 1112 Karpen Bldg., Chicago. Annual meeting, June 9-11, 1915, Atlantic City, N. J.  
 AMERICAN RAILWAY SAFETY ASSOCIATION.—L. F. Shedd, C. R. I. & P., Chicago.  
 AMERICAN RAILWAY TOOL FOREMEN'S ASSOCIATION.—Owen D. Kinsey, Illinois Central, Chicago. Annual meeting, July 19-21, 1915, Hotel Sherman, Chicago.  
 AMERICAN SOCIETY FOR TESTING MATERIALS.—Prof. E. Marburg, University of Pennsylvania, Philadelphia, Pa. Annual meeting, June 22-26, 1915, Hotel Traymore, Atlantic City, N. J.  
 AMERICAN SOCIETY OF CIVIL ENGINEERS.—Chas. W. Hunt, 220 W. 57th St., New York. Regular meetings, 1st and 3d Wednesday in month, except June, July and August, 220 W. 57th St., New York.  
 AMERICAN SOCIETY OF MECHANICAL ENGINEERS.—Calvin W. Rice, 29 W. 39th St., New York. Next meeting, June, 1915, Buffalo, N. Y. Annual meeting, December 7-10, 1915, New York.  
 AMERICAN WOOD PRESERVERS' ASSOCIATION.—F. J. Angier, Supt. Timber Preservation, B. & O., Mt. Royal Sta., Baltimore, Md. Next convention, January 18-20, 1916, Chicago.  
 ASSOCIATION OF AMERICAN RAILWAY ACCOUNTING OFFICERS.—E. R. Woodson, 1300 Pennsylvania Ave., N. W., Washington, D. C. Annual convention, April 28, 1915, Piedmont Hotel, Atlanta, Ga.  
 ASSOCIATION OF MANUFACTURERS OF CHILLED CAR WHEELS.—George W. Lyndon, 1214 McCormick Bldg., Chicago.  
 ASSOCIATION OF RAILWAY CLAIM AGENTS.—C. W. Egan, B. & O., Baltimore, Md. Annual meeting, May 19, 1915, Galveston, Tex.  
 ASSOCIATION OF RAILWAY ELECTRICAL ENGINEERS.—Jos. A. Andreucetti, C. & N. W., Room 411, C. & N. W. Sta., Chicago. Annual meeting, October, 1915.  
 ASSOCIATION OF RAILWAY TELEGRAPH SUPERINTENDENTS.—P. W. Drew, Soo Line, 112 West Adams St., Chicago. Annual meeting, June 22-25, 1915, Rochester, N. Y.  
 ASSOCIATION OF TRANSPORTATION AND CAR ACCOUNTING OFFICERS.—G. P. Conard, 75 Church St., New York. Next meeting, June 23-25, Niagara Falls, N. Y.  
 BRIDGE AND BUILDING SUPPLY MEN'S ASSOCIATION.—L. D. Mitchell, Detroit Graphite Co., Chicago, Ill. Meetings with American Railway Bridge and Building Association.  
 CANADIAN RAILWAY CLUB.—James Powell, Grand Trunk, P. O. Box 7, St. Lambert (near Montreal), Que. Regular meetings, 2d Tuesday in month, except June, July and August, Windsor Hotel, Montreal, Que.  
 CANADIAN SOCIETY OF CIVIL ENGINEERS.—Clement H. McLeod, 176 Mansfield St., Montreal, Que. Regular meetings, 1st Thursday in October, November, December, February, March and April. Annual meeting, January, Montreal.  
 CAR FOREMEN'S ASSOCIATION OF CHICAGO.—Aaron Kline, 841 Lawler Ave., Chicago. Regular meetings, 2d Monday in month, except July and August, Lytton Bldg., Chicago.  
 CENTRAL RAILWAY CLUB.—H. D. Vought, 95 Liberty St., New York. Regular meetings, 2d Friday in January, May, September and November. Annual meeting, 2d Thursday in March, Hotel Statler, Buffalo, N. Y.  
 ENGINEERS' SOCIETY OF WESTERN PENNSYLVANIA.—Elmer K. Hiles, 2511 Oliver Bldg., Pittsburgh, Pa. Regular meetings, 1st and 3d Tuesday, Pittsburgh.  
 FREIGHT CLAIM ASSOCIATION.—Warren P. Taylor, R. F. & P., Richmond, Va. Annual meeting, June 16, 1915, Chicago.  
 GENERAL SUPERINTENDENTS' ASSOCIATION OF CHICAGO.—A. M. Hunter, 321 Grand Central Station, Chicago. Regular meetings, Wednesday, preceding 3d Thursday in month, Room 1856, Transportation Bldg., Chicago.



**INTERNATIONAL RAILWAY FUEL ASSOCIATION.**—C. G. Hall, C. & E. I., 922 McCormick Bldg., Chicago. Annual meeting, May 17-20, 1915, Hotel La Salle, Chicago.

**INTERNATIONAL RAILWAY GENERAL FOREMEN'S ASSOCIATION.**—Wm. Hall, 1126 W. Broadway, Winona, Minn. Next convention, July 14-17, 1915, Sherman House, Chicago.

**INTERNATIONAL RAILROAD MASTER BLACKSMITHS' ASSOCIATION.**—A. L. Woodworth, C. H. & D., Lima, Ohio. Annual meeting, August 17, 1915, Philadelphia, Pa.

**MAINTENANCE OF WAY AND MASTER PAINTERS' ASSOCIATION OF THE UNITED STATES AND CANADA.**—T. I. Goodwin, C. R. I. & P., Eldon, Mo. Next meeting, October 19-21, 1915, St. Louis, Mo.

**MASTER BOILER MAKERS' ASSOCIATION.**—Harry D. Vought, 95 Liberty St., New York. Annual convention, May 26 to 28, 1915, Chicago, Ill.

**MASTER CAR AND LOCOMOTIVE PAINTERS' ASSOCIATION OF THE UNITED STATES AND CANADA.**—A. P. Dane, B. & M., Reading, Mass. Next convention, September 14-17, 1915, Detroit, Mich.

**MASTER CAR BUILDERS' ASSOCIATION.**—J. W. Taylor, 1112 Karpen Bldg., Chicago. Annual meeting, June 14-16, 1915, Atlantic City, N. J.

**NATIONAL RAILWAY APPLIANCES ASSOCIATION.**—Bruce V. Crandall, 537 So. Dearborn St., Chicago. Next convention, March 15-19, 1915, Chicago.

**NEW ENGLAND RAILROAD CLUB.**—W. E. Cade, Jr., 683 Atlantic Ave., Boston, Mass. Regular meetings, 2d Tuesday in month, except June, July, August and September, Boston.

**NEW YORK RAILROAD CLUB.**—Harry D. Vought, 95 Liberty St., New York. Regular meetings, 3d Friday in month, except June, July and August, 29 W. 39th St., New York.

**NIAGARA FRONTIER CAR MEN'S ASSOCIATION.**—E. Frankenberger, 623 Brisbane Bldg., Buffalo, N. Y. Meetings monthly.

**PEORIA ASSOCIATION OF RAILROAD OFFICERS.**—M. W. Rotchford, Union Station, Peoria, Ill. Regular meetings, 2d Thursday in month, Jefferson Hotel, Peoria.

**RAILROAD CLUB OF KANSAS CITY.**—C. Manlove, 1008 Walnut St., Kansas City, Mo. Regular meetings, 3d Friday in month, Kansas City.

**RAILROAD MASTER TINNERS, COPPERSMITHS AND PIPEFITTERS' ASSOCIATION.**—U. G. Thompson, C. & E. I., Danville, Ill. Annual meeting, May, 1915.

**RAILWAY BUSINESS ASSOCIATION.**—Frank W. Noxon, 30 Church St., New York. Annual meeting, December, 1915, Waldorf-Astoria Hotel, New York.

**RAILWAY CLUB OF PITTSBURGH.**—J. B. Anderson, Room 207, P. R. R. Sta., Pittsburgh, Pa. Regular meetings, 4th Friday in month, except June, July and August, Monongahela House, Pittsburgh.

**RAILWAY ELECTRICAL SUPPLY MANUFACTURERS' ASSOCIATION.**—J. Scribner, 1021 Monadnock Block, Chicago. Meetings with Association of Railway Electrical Engineers.

**RAILWAY FIRE PROTECTION ASSOCIATION.**—C. B. Edwards, Fire Ins. Agt., Mobile & Ohio, Mobile, Ala. Next meeting, October 5-7, 1915, Chicago.

**RAILWAY SIGNAL ASSOCIATION.**—C. C. Rosenberg, Times Bldg., Bethlehem, Pa. Next meeting, March 15, 1915, Chicago. Annual meeting, September 21-24, 1915, Salt Lake City, Utah.

**RAILWAY STOREKEEPERS' ASSOCIATION.**—J. P. Murphy, L. S. & M. S., Box C, Collinwood, Ohio. Annual meeting, May 17-19, 1915, Hotel Sherman, Chicago.

**RAILWAY SUPPLY MANUFACTURERS' ASSOCIATION.**—J. D. Conway, 2136 Oliver Bldg., Pittsburgh, Pa. Meetings with Master Car Builders and Master Mechanics Associations.

**RAILWAY TELEGRAPH AND TELEPHONE APPLIANCE ASSOCIATION.**—G. A. Nelson, 50 Church St., New York. Meetings with Association of Railway Telegraph Superintendents.

**RICHMOND RAILROAD CLUB.**—F. O. Robinson, C. & O., Richmond, Va. Regular meetings, 2d Monday in month, except June, July and August.

**ROADMASTERS' AND MAINTENANCE OF WAY ASSOCIATION.**—L. C. Ryan, C. & N. W., Sterling, Ill. Annual meeting, September 14-16, 1915, Chicago.

**ST. LOUIS RAILWAY CLUB.**—B. W. Frauenthal, Union Station, St. Louis, Mo. Regular meetings, 2d Friday in month, except June, July and August, St. Louis.

**SALT LAKE TRANSPORTATION CLUB.**—R. E. Rowland, Hotel Utah Bldg., Salt Lake City, Utah. Regular meetings, 1st Saturday of each month, Salt Lake City.

**SIGNAL APPLIANCE ASSOCIATION.**—F. W. Edmunds, 3868 Park Ave., New York. Meeting with annual convention Railway Signal Association.

**SOCIETY OF RAILWAY FINANCIAL OFFICERS.**—Carl Nyquist, C. R. I. & P., La Salle St. Sta., Chicago. Annual meeting, September, 1915.

**SOUTHERN ASSOCIATION OF CAR SERVICE OFFICERS.**—E. W. Sandwich, A. & W. P. R. R., Atlanta, Ga. Annual meeting, January, 1916.

**SOUTHERN & SOUTHWESTERN RAILWAY CLUB.**—A. J. Merrill, Grant Bldg., Atlanta, Ga. Regular meetings, 3d Thursday, January, March, May, July, September, November, 10 A. M., Candler Bldg., Atlanta.

**TOLEDO TRANSPORTATION CLUB.**—Harry S. Fox, Toledo, Ohio. Regular meetings, 1st Saturday in month, Boody House, Toledo.

**TRACK SUPPLY ASSOCIATION.**—W. C. Kidd, Ramapo Iron Works, Hillburn, N. Y. Meetings with Roadmasters' and Maintenance of Way Association.

**TRAFFIC CLUB OF CHICAGO.**—W. H. Wharton, La Salle Hotel, Chicago.

**TRAFFIC CLUB OF NEWARK.**—John J. Kautzmann, P. O. Box 238, Newark, N. J. Regular meetings, 1st Monday in month, except July and August, The Washington, Newark.

**TRAFFIC CLUB OF NEW YORK.**—C. A. Swope, 291 Broadway, New York. Regular meetings last Tuesday in month, except June, July and August, Waldorf-Astoria, New York.

**TRAFFIC CLUB OF PITTSBURGH.**—D. L. Wells, Erie R. R., Pittsburgh, Pa. Meetings bi-monthly, Pittsburgh. Annual meeting, 2d Monday in June.

**TRAFFIC CLUB OF ST. LOUIS.**—A. F. Versen, Mercantile Library Bldg., St. Louis, Mo. Annual meeting in November. Noonday meetings October to May.

**TRAIN DESPATCHERS' ASSOCIATION OF AMERICA.**—J. F. Mackie, 7122 Stewart Ave., Chicago. Annual meeting June 15, 1915, Minneapolis, Minn.

**TRANSPORTATION CLUB OF DETROIT.**—W. R. Hurley, Superintendent's office, L. S. & M. S., Detroit, Mich. Meetings monthly, Normandie Hotel, Detroit.

**TRAVELING ENGINEERS' ASSOCIATION.**—W. O. Thompson, N. Y. C. R. R., East Buffalo, N. Y. Annual meeting, September, 1915, Chicago.

**WESTERN CANADA RAILWAY CLUB.**—L. Kon, Immigration Agent, Grand Trunk Pacific, Winnipeg, Man. Regular meetings, 2d Monday, except June, July and August, Winnipeg.

**WESTERN RAILWAY CLUB.**—J. W. Taylor, 1112 Karpen Bldg., Chicago. Regular meetings, 3d Tuesday in month, except June, July and August, Karpen Bldg., Chicago.

**WESTERN SOCIETY OF ENGINEERS.**—J. H. Warder, 1735 Monadnock Block, Chicago. Regular meetings, 1st Monday in month, except January, July and August, Chicago. Extra meetings, except in July and August, generally on other Monday evenings.

## Traffic News

Traffic officers of the transcontinental railways began a meeting in Chicago on Monday to arrange for putting into effect the latest decision of the Interstate Commerce Commission in the intermountain rate case, which gave relief from the fourth section on a large number of commodities, permitting the railroads to make lower rates to the Pacific coast terminals from eastern points than to intermediate points, in order to meet competition of vessels sailing through the Panama Canal.

### Traffic Club of Chicago

The nominating committee of the Traffic Club of Chicago has selected the following as the regular ticket of officers for the ensuing year: President, Fred Zimmerman, vice-president, Chicago, Indianapolis & Louisville; first vice-president, F. L. Bateman, president, Transcontinental Freight Company; second vice-president, W. O. Davis, division freight agent, American Steel & Wire Company; third vice-president, W. J. Leahy, general passenger agent, Chicago, Rock Island & Pacific; secretary, W. H. Wharton, commercial agent, Nashville, Chattanooga & St. Louis; treasurer, Charles B. Hopper, general freight agent, Goodrich Transit Company. Directors for two years: J. Charles Maddison, secretary, Montgomery Ward & Company; J. G. McAuliffe, traffic manager, Butler Brothers; C. W. Pitts, general agent passenger department, Great Northern; E. W. Skipworth, assistant general traffic manager, Sulzberger & Sons Company. The annual meeting and election will be held on March 30.

### River Traffic in the United States

The United States Department of Agriculture has issued bulletin 74 on Inland Boat Service, dealing with freight rates, time of transit and length of routes. Long passenger runs are a thing of the past. A few hundred miles, the investigator found, is usually the maximum run for any steamboat. On only 25 of the 102 routes for which this information was available, was the average rate of speed over 10 miles an hour and on 37 it was less than 6.

In the east the principal routes of steamboat lines, include those of the Hudson river and the Chesapeake bay. On the Hudson there is considerable variety of traffic, through service between New York City and Albany, a number of shorter routes between various cities along this line, and thirdly the through traffic of canal boats carrying cargoes from the Erie canal to tidewater. In Chesapeake bay traffic radiates principally from the cities of Baltimore, Washington and Norfolk.

The longest routes are to be found in the Mississippi Valley. From Cincinnati regular lines run down the Ohio and Mississippi rivers as far as Memphis, 749 miles. From St. Louis regular boats run to St. Paul and to Memphis. Other lines reach Kansas City and Peoria, and one goes up the Tennessee river as far as Waterloo, Alabama. From Memphis boats run to Vicksburg, where they connect with boats for New Orleans. From New Orleans there is a line up the Red and Black rivers to Harrisonburg, La., and other routes traverse the network of rivers, bayous and canals in southern Louisiana as far west as Bayou Teche, and as far north as the Red river. There is also considerable traffic on Lake Pontchartrain.

On the Pacific coast an important system of waterways consists of the rivers emptying into San Francisco bay, and here there is a rich truck region which is not conveniently reached by rail, but is comparatively easy of access by boat. San Francisco, Sacramento and Stockton are the principal centers for this traffic. A second coast system consists of the Columbia river and its tributaries. From Portland steamers run down the Columbia to Astoria and up as far as Celilo Falls. Above the Celilo Falls other boats reach points on the upper Columbia and Snake rivers.

**AN ENGLISH RAILWAY'S BIG BUSINESS.**—The Great Northern Railway has recently handled more cars at its London end than at any previous time in the history of the line.

## Commission and Court News

### INTERSTATE COMMERCE COMMISSION

At a hearing before Examiner Kelly of the Interstate Commerce Commission at Chicago last week the eastern railroads voluntarily withdrew tariffs increasing the rates on meat and packing house products, which had been suspended by the commission, to file new tariffs advancing the rates by only 5 per cent.

#### Rates on Farm Wagons from Toledo

*Milburn Wagon Company v. Ann Arbor, et al. Opinion by Commissioner Harlan:*

The adjustment of rates from Toledo, on horse-drawn freight vehicles, farm wagons, carts and dump wagons to Illinois, Wisconsin, Minnesota, to points west of the Mississippi river and to Mexico is alleged to be inherently unreasonable, in part by reason of unreasonable official classification ratings, and on a relatively higher basis than from Chicago, Milwaukee, Racine, etc., to the undue preference of these places. The commission adheres to its decision in the *Commercial Club of Terre Haute v. Vandalia*, 29 I. C. C., 383, and holds that the other cities are not similarly circumstanced and that the adjustment of rates from Toledo is not unreasonable. (32 I. C. C., 582.)

#### Rates on Fruits from Points in Florida to Montana

*Lindsay & Company, Ltd., et al. v. Northern Pacific et al. Opinion by Commissioner McChord:*

The commission finds that the carrier's rates of \$1.62½ per 100 lb. on grapefruit in carloads and \$1.60 on fresh tomatoes in carloads from Jacksonville and other basing points in Florida, when from beyond, to Helena, Great Falls, Butte and Billings, Mont., are not unreasonable. It is held, however, that the present rate of \$1.76 on oranges in carloads and grape-fruit and oranges in mixed carloads from the same points to the same destinations is unreasonable to the extent that it exceeds \$1.62½.

The present minimum weight of 26,000 lb. on grapefruit and oranges in straight or mixed carloads is found unreasonable to the extent that it exceeds 24,000 lb. (33 I. C. C., 150.)

#### Rates on Lumber from Points in Virginia

*Massie & Pierce Lumber Company et al. v. Norfolk & Western et al. Opinion by the commission:*

Complainants, shipping lumber from points on the Durham division of the Norfolk & Western, between Lynchburg and the North Carolina state line; from Dillard, on a branch of the Norfolk & Western, extending south from Blackstone; from certain points on the Southern, between Richmond and Burkeville, and from a number of points on the Virginian, between Alta Vista and Suffolk, all of which points are east of Roanoke and south of the James river, ask that these points be given Virginia city rates on lumber to points in Buffalo-Pittsburgh and central freight association territories. The commission finds that such rates should not be granted. The common point rate adjustment at the Virginia cities is a result of the competition of carriers and is of long standing. It applies to traffic in general, and if it were overthrown, as would be the case if complainants' request were granted, the resulting permanent realignment of rates would be very far-reaching. The commission is not prepared to condemn the Virginia cities rate adjustment on a record which involves but one commodity, and which excludes questions under the long-and-short-haul rule. (33 I. C. C., 14.)

#### Lumber Rates from Points on the Pacific & Idaho Northern

*Boise Lumber Company, Ltd., v. Pacific & Idaho Northern et al. Opinion by Commissioner Clark:*

The commission finds that the joint rate of nine cents per 100 lb., charged by the Pacific & Idaho Northern and the Oregon Short Line, on saw logs from New Meadows, Tamarack and other so-called group A points on the Pacific & Idaho Northern in Idaho via Ontario, Ore., to Boise, is unreasonable and should not exceed seven cents per 100 lb.; minimum weight,

40,000 lb. The complainants requested a rate of 3.1 cents. The commission states, "Every shipper is entitled to a reasonable rate; but if the nature or value of a commodity offered for transportation is such as to demand an unreasonably low rate, there is no lawful obligation upon the carrier to meet this demand."

The United States government and the state of Idaho own, respectively, 175,877,000 ft. and 55,000,000 ft. of merchantable timber tributary to the Pacific & Idaho Northern which must move via rail. It is stated that this timber is subject to deterioration if allowed to stand longer and that efforts to dispose of it have been unavailing, the controlling obstacle being the freight rate to Boise. The development of these timber tracts is alleged to be of paramount importance, but the commission, following the decision in *Railroad Commissioners of Montana v. Butte, Anaconda & Pacific* (31 I. C. C., 641), states that "the national or public aspect of this matter is one of general governmental policy and not one which the law intrusts to the commission to determine." (33 I. C. C., 109.)

#### Regulations Restricting the Shape of Baggage

*Opinion by Commissioner Hall:*

The commission in Regulations Restricting the Dimensions of Baggage (26 I. C. C., 292) said that

Upon notice of not less than one year carriers may provide that trunks or other rigid containers with more than two bulging sides, or with two bulging sides that are not opposite to each other, will not be accepted for checking as baggage.

The following rule was adopted by the carriers in accordance therewith:

Trunks or cases constructed in the form of a trunk, or other rigid containers which are not square or rectangular, will not be accepted for transportation in regular baggage service, except that such trunks, cases, or other rigid containers will be accepted for transportation provided that they have not to exceed two bulging sides and the bulging sides are opposite to each other.

The commission finds that this rule must be canceled because it is arbitrary and unreasonable in so far as it is intended to exclude from the regular baggage service the so-called "pentagonal trunks" used by the salesmen of protestants, the National Cash Register Company and the Toledo Scale Company. Each salesman takes with him when he is on the road one of these trunks, containing one complete cash register or scale. The trunks weigh from 200 to 250 lb. Although they must rest on their bases they are small and compact and are handled better than many other articles carried in the regular baggage service. The salesmen travel as a rule on local trains on which the available baggage space is rarely crowded. It was shown that the rule would seriously interfere with protestants' business, and that there would be no corresponding benefit for the carriers. (33 I. C. C., 266.)

#### The Nashville Terminal Case

*City of Nashville et al. v. Louisville & Nashville, et al. Opinion by Commissioner Meyer:*

The Louisville & Nashville and the Nashville, Chattanooga & St. Louis own separate terminals at Nashville, but operate them jointly as the "Nashville terminals," the total expense of maintenance and operation being apportioned on the basis of the number of cars and locomotives handled. Both roads thus serve the industries on each other's tracks in addition to the industries on their own, without charge to shippers. The two roads since 1907 have interchanged with the Tennessee Central all noncompetitive traffic, except coal, at \$3 a car, coal being switched only at 60 cents a ton. In *Traffic Bureau of Nashville v. Louisville & Nashville* (28 I. C. C., 533), affirmed in *Louisville & Nashville v. United States* 216 Fed. 672, it was held that this constituted discrimination and the roads were ordered to follow the same practice in switching of coal from and to the Tennessee Central, as they maintained with respect to shipments from and to their own tracks. The carriers construed this order to relate exclusively to noncompetitive coal, but have continued their former practice as to competitive coal. Competitive traffic of all kinds is interchanged at local rates amounting to from \$5 to \$36 per car.

Complainants ask that the roads be required to interchange with the Tennessee Central at a uniform charge not to exceed \$2 a car.

The commission finds that a charge of \$3 for switching Tennessee Central noncompetitive traffic is not unreasonable.

The commission also believes that the defendants have inter-



preted too narrowly the decision in *Traffic Bureau of Nashville v. Louisville & Nashville*, because, although that case related exclusively to coal, the decision and order related to competitive as well as noncompetitive coal.

The commission also finds that defendants' refusal to switch competitive traffic to and from the Tennessee Central on the same terms as noncompetitive traffic while interchanging both kinds of traffic on the same terms with each other is discriminatory. As long as defendants switch both competitive and noncompetitive traffic for each other at a charge equal to the cost of service, exclusive of fixed charges, the charges imposed for switching Tennessee Central traffic should not exceed the cost of the service, which, as had been shown, is approximately \$3 per car.

The commission believes that since defendants interchange traffic with each other they cannot refuse to interchange traffic upon substantially the same terms with the Tennessee Central, provided the circumstances and conditions are substantially the same, and defendants are not required "to give the use of their tracks or terminal facilities" to the Tennessee Central within the meaning of section 3. The commission does not agree with defendants' contention that they cannot be compelled to "short haul" their own lines in favor of the Tennessee Central, because each line is already "short hauling" itself in favor of the other. The commission also gives weight to the contention that defendants' terminals are admittedly open to noncompetitive Tennessee Central traffic, even though at prohibitive rates. (33 I. C. C., 76.)

#### Rates on Tomatoes from Jacksonville to Kansas City

*In re rates on tomatoes from Jacksonville, Fla., to Kansas City, Mo., and other points. Opinion by Commissioner Clements:*

Rates from Jacksonville and other Florida base points to points west of the Mississippi river, applicable on tomatoes originating in Florida, are made by combination of proportional rates to the Ohio and Mississippi river crossings and class rates beyond, the lowest combination in each case fixing the amount of the rate via all routes. Following a change in the rating of tomatoes in western classification from class C, minimum 24,000 lb., to fifth class, minimum 20,000 lb., and a consequent increase in the rates to points west of the Mississippi river from the Ohio and Mississippi river crossings, it is now proposed to increase to the same extent rates on tomatoes originating in Florida, the increase to accrue entirely to the lines west of the crossings. With the increase would go a reduction of 4,000 lb. in the carload minimum weight. The commission finds that these charges would be justified. (33 I. C. C., 145.)

#### Reparation Arising from Failure to Furnish Cars

*Vulcan Coal & Mining Company v. Illinois Central. Opinion by Commissioner Meyer:*

Complainants, operating mines at Belleville and Coulterville, Ill., on the Illinois Central, allege that during certain periods of 1911, 1912 and 1913 defendants failed to furnish a reasonably adequate supply of cars. The commission is asked to award reparation equal to the loss of profit on interstate shipments, which would have been made had the car supply been reasonable, plus the greater cost of mining due to restricted output. The commission, in this report, does not attempt to determine whether or not the car supply was legally adequate, nor to determine the amount of damages, both of these questions being left for a subsequent hearing; and the report is mainly devoted to a discussion of the commission's jurisdiction, the defendants having argued that this is a question for determination by the courts.

The commission, following the decision of the United States Supreme Court in *Texas & Pacific v. Abilene Cotton Oil Company* (204 U. S., 426), contends that the question as to the extent to which defendant failed to comply with the duty it owed complainant is an administrative one, of which the commission alone can take original jurisdiction. In the Supreme Court case suit was brought to recover damages resulting from the exaction of an alleged unreasonable rate. This rate was stated in a schedule duly filed and published, but the commission had never passed on its legality. The court refused to construe the act as conferring any right to recover damages for unreasonable charges prior to a finding by the commission. This case was followed by a number of other important cases.

As concerns a reasonable rate, these cases in general hold that the commission is given jurisdiction to determine what is

a reasonable rate, but that the courts have jurisdiction in case a carrier collects a rate which has already been determined by the commission to be unreasonable. It is not wise for the courts to determine what is a reasonable rate, because various decisions might not agree on the same rate.

As to the carrier's duty to furnish cars, the commission believes that its contention above must be correct unless it be the carrier's absolute duty to furnish cars to the full extent of the shipper's demand, which, of course, is manifestly impossible. It is the carrier's duty to maintain a reasonably adequate car supply, and the question of what is a reasonably adequate car supply is just as much an administrative one as the question of what is a reasonable rate. The legal sufficiency of defendant's car supply cannot be definitely fixed by statute. It does not necessarily follow, however, that every case involving car supply must first come before this commission. It is obvious that if a carrier should absolutely refuse to furnish any cars, the courts could take primary jurisdiction.

The commission also holds that the assumption of jurisdiction in the present case is not inconsistent with the mandamus provisions of section 23 of the act. It is not believed that defendant is deprived of its right under the seventh amendment of the constitution, or that considerations of expediency should have weight in deciding whether or not the commission should assume jurisdiction.

As stated above, the commission at this time does not attempt to decide whether defendant's supply of cars was legally sufficient. The defendant contends that its car supply during the period set forth was such and draws attention to the purchases of rolling stock and of extensions of terminal facilities which have been made since 1911. The commission agrees that a carrier cannot be expected to maintain a car supply which will meet all demands of the operators under all conditions, for if the carriers were to equip themselves to meet at any moment the maximum demands, the public would be obliged to pay interest upon the additional investment and for the maintenance of the facilities. It is stated, however, that "although a full car supply cannot be expected all the time, carriers must do more than to provide themselves with sufficient equipment for the slack period of coal production."

Commissioner Clark, in a dissenting opinion in which Commissioners Harlan and Clements concur, notes that the commission has never been understood to possess the power to require a carrier to enlarge its facilities or service or to award damages against a carrier for failure so to do. Indeed, if the carrier must respond in damages because of its inability to furnish cars at a time of unusual demand, it seems that the right of that carrier to confine its equipment to its own rails must be recognized, but that right has been specifically denied in *Missouri & Illinois Coal Company v. Illinois Central* (22 I. C. C., 39). The dissenting opinion states:

"For all of these reasons, together with the fact that the commission's orders for the payment of money are only *prima facie* evidence in the courts, in connection with which the court may receive additional testimony which has not been presented to the commission, I think that the question of requiring a carrier to provide itself with additional facilities or respond in damages for failure so to do is essentially a judicial question, jurisdiction of which reposes in the courts, which have authority to create and direct the conduct of receiverships, and not in the commission, which has been created to exercise certain delegated powers legislative in character." (33 I. C. C., 52.)

#### STATE COMMISSIONS

The Massachusetts Public Service Commission has reported on the requests of the Boston & Maine, the Boston & Albany and the New York, New Haven & Hartford, presented several months ago, for authority to advance passenger fares. The New Haven will be permitted to increase one-way single fare rates outside the Boston suburban zone from 2¼ to 2½ cents a mile basis. The petitions of the other two roads are disallowed, because the form of the proposed tariffs is unsatisfactory. The board suggests that these roads file applications for increases on a basis similar to that used in the New Haven tariffs. The commission seems disposed to authorize a rate of 2½ cents a mile, except for the travel within 15 miles of Boston, but presents a mass of criticisms of the season and other reduced-rate tickets of the Boston & Maine and the Boston & Albany.

## COURT NEWS

The Court of Appeals of New York last week handed down decisions in the Heim and Crane cases, upholding the constitutionality of the labor law of that State in respect to the provision which forbids the employment of any but citizens of the United States on contracts for public work. This decision affects all of the contracts on the new subways which the city now has outstanding, and which aggregate about \$142,000,000. There are thirty separate contracting firms engaged in the work, and they employ about 16,000 men. Two days after the decision was published one of the contractors had suspended work and others were proceeding with reduced forces. It is the contention of the contractors that it is next to impossible to procure American citizens to do the kind of work which hitherto has been done by foreigners. The contractors, however, have announced that they will obey the law. Unless the law can be repealed or modified large numbers of aliens must be dismissed. This law has been on the statute books many years, but was a dead letter, as regards aliens, until the labor unions a few months ago started these suits.

### Limitation of Liability—Shipment to Foreign Country

A bill of lading provided that the carrier agreed to transport only over its own line and act as agent as to the balance of the route, and should not be liable for loss or injury to the goods not occurring on its own road, except as liability might be imposed by law. The railroad company took from the shipper a release, releasing the company and all other transportation companies from liability from leakage, shrinkage, etc., except such as might occur from negligence. The Wisconsin Supreme Court holds that under these contracts the liability of the initial carrier was limited to its own line. It was contended that the Carmack amendment to the Interstate Commerce act made the initial carrier liable, but the court held that it did not apply to the case, because the shipment here was not from "a point in one state to a point in another state," but from a point in one state to a foreign country (Wisconsin to Manitoba). *Best v. Great Northern (Wis.)*, 150 N. W. 484.

### Abolition of Grade Crossing—Liability to Property Owner

New York Railroad Law, Section 91, provides that any railroad which crosses or is crossed by a street at grade may petition for an alteration in the character of such crossing, or, if not practicable to change it from grade, for its discontinuance, and the opening of another crossing. Section 21 provides that the road shall restore intersecting streets to their former condition. On petition of a road showing that public safety required the elimination of a grade crossing at a street, the Public Service Commission made an order directing that such street be carried under the railroad at a different point, so that the old grade crossing was abolished and the lines of both the railroad and the street changed. The new railroad line crossed the old street at a new point on an embankment, thus closing the old street at the new point of intersection. This left an owner's property at the end of a cul-de-sac, and made it necessary for him to travel further to reach the street. It was held by the New York Court of Appeals, in an action by the owner against the railroad, that the statute justified the change of grade and relieved the road from liability to the plaintiff.—*Danner v. New York & H.*, 106 N. E. 1,029.

### Right to Free Pass—Right to Eject Passenger—Company's Rule

In an action for wrongful ejection it appeared that a joint pass had been issued to one Bass and four other unnamed persons, of whom the plaintiff was one. After they boarded the train the conductor accepted the pass, punched it and returned it to Bass. Bass and others of the party, not including the defendant, however, having indulged too freely in liquor, became so disorderly as to justify and necessitate their ejection at an intermediate station. There was a rule of the defendant company, of which the defendant alleged the plaintiff had knowledge, that, when the person whose name appeared in the face of the pass was ejected from or left the train before arriving at the place to which he was entitled to go, the other person or persons for whom the pass was intended, but who were not named

therein, would also, unless they paid fare, have to leave the train with the person named in the pass. The plaintiff, upon the ejection of Bass, neither tendered nor paid fare, and was consequently ejected, but the conductor used no more force than was reasonably necessary.

In reversing judgment for the plaintiff because of certain erroneous rulings of the trial court, it was held that a person riding on a pass is not a trespasser, and even when the pass is withdrawn (assuming, which is not ordinarily the case, that a conductor is clothed with authority to withdraw a pass or license that has been lawfully issued by the authorized agent of a railroad company), the holder should be given an opportunity to pay fare before he is ejected. The court held that if, as alleged, the plaintiff was an employee of a contractor for the rebuilding or repair of one of the defendant's buildings, and the defendant, as part consideration of the contract, had agreed to furnish free transportation for the contractor's men, he was a person to whom a pass might be issued under the Alabama statute. Assuming the pass was valid, if Bass was lawfully ejected, so was the plaintiff by operation of the company's rule, if he knew or was informed of it. The price paid by the plaintiff for a meal for one of the party at the place of ejection was not an element of damage, nor was the price paid for a meal for himself except to the extent that the cost exceeded what the plaintiff would have had to pay if permitted to ride. *L. & N. v. Dawson*, Alabama Court of Appeals, 66 So. 905.

### Scope of Employment—Duty to Guard Dangerous Appliances

While the men in the boiler department of a railroad shop were resting at midnight, eating their luncheons, an employer playfully turned a compressed air hose upon a fellow servant, and killed him. In an action against the railroad company, the court held that it was not liable. The employees at the time were not engaged in the master's business, and the accident was not due to any violation of duty by the master. The compressed air hose was held not to be such a dangerous agency as to require the master to guard it to prevent its being used by unfit employees. The court likened the case to that of *Ballard v. L. & N.*, 128 Ky., 826, 110 S. W. 296, 16 L. R. A. (N. S.) 1052. There the following propositions were decided: (a) "That a servant competent for the work for which he is employed is careless, reckless, stupid, and unfit to handle other appliances in the shop does not render the master liable for the use of a compressed air hose which it is not his duty to handle, but his handling of which by way of prank has not been stopped, in such a way that the air enters the body of a co-servant and kills him. (b) A compressed air hose is not a dangerous agency requiring a master to guard it so that ignorant or reckless persons cannot use it to the injury of others." In that case the person killed was an apprentice, and was engaged in the master's service when a fellow servant slipped up behind him and turned the hose on him, killing him. It was alleged that the co-servant who did the wrongful act was a careless, reckless, and stupid boy, and unfit for the employment, and that all this was known to the master, or to his superintendent, and such negligent servant was retained after such knowledge; that the superintendent knew that the boy at fault had been using the hose on the deceased on prior occasions, and knew it was dangerous; yet he had never warned the deceased or the negligent servant, both of whom were minors. Notwithstanding all these facts being alleged, making it a much stronger case than the present, the Kentucky court held that the complaint stated no cause of action.

The court also referred to the case of *Western Railway of Alabama v. Milligan*, 135 Ala. 205, 33 So. 438. In that case the plaintiff was very ticklish, or what is called "goosey," and, when punched, he jumped frantically and made ridiculous gyrations. The superintendent of the defendant railway company ordered him to brush off a table on which knives were revolving, and as he was about to brush the table, or in the act of doing so, the superintendent "goosed" him. He jumped frantically, as usual, throwing his hands under the knives, and was badly cut. The court held that the act of the superintendent was not an act of superintendence, for the consequences of which, under the Employer's Liability Act, the company could be held liable. It bore no sort of relation to the work the superintendent had directed the plaintiff to do. *Kirby v. L. & N.*, Alabama Supreme Court, 65 So. 358.



## Railway Officers

### Executive, Financial, Legal and Accounting

Frank G. Drum, San Francisco, Cal., and Warren Olney, Jr., general counsel of the Western Pacific, at San Francisco, have been appointed receivers of the Western Pacific.

Arthur E. Haid has been appointed assistant general attorney of the St. Louis & San Francisco, with headquarters at St. Louis, Mo.

E. M. Bagley has resigned as claims attorney for the Oregon Short Line to engage in the general practice of law at Salt Lake City, Utah.

Clayton Snyder, assistant secretary of the National Railways of Mexico, with office at New York, has resigned, to become assistant treasurer of the Pittsburgh Steel Company, Pittsburgh, Pa., and E. E. Bashford, who was assistant secretary at New York in 1910, is now acting assistant secretary.

Robert R. Hulme, assistant auditor of merchandise traffic of the Philadelphia & Reading and subsidiary companies at Philadelphia, Pa., has been appointed auditor of merchandise traffic with office at Philadelphia, succeeding William B. Scott, retired from service, and Henry Forster succeeds Mr. Hulme.

J. S. Joyce has been elected president of the Tremont & Gulf with headquarters at Chicago, succeeding R. B. Fowler, who was elected vice-president and appointed general manager, with headquarters at Winnfield, La. Mr. Joyce has been elected president also of the Groveton, Lufkin & Northern, succeeding Mr. Fowler, who was appointed general manager of that road.

H. H. Larimore, district claim agent for the Missouri Pacific-Iron Mountain System at Kansas City, Mo., has been appointed assistant attorney for the system, with office at St. Louis, Mo., succeeding W. Scott Hancock, who has resigned to engage in the general practice of law. C. D. Jeffers, district claim agent at Poplar Bluff, Mo., succeeds Mr. Larimore, and J. B. Collins, claim agent at Atchison, Kan., succeeds Mr. Jeffers.

Edward Francis Kearney, whose election as president of the Wabash, with headquarters at St. Louis, Mo., has already been announced in these columns, was born March 27, 1865, and

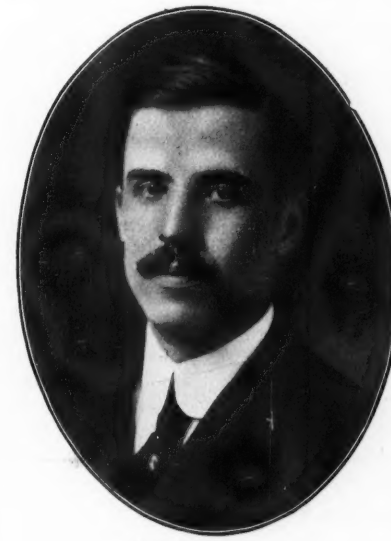
began railway work in 1882 as telegraph operator for the Pennsylvania Lines. He remained with that road until February, 1903, being employed successively as freight clerk, chief operator in superintendent's office, train dispatcher, trainmaster's clerk, chief clerk to superintendent and trainmaster. The following year he was superintendent of the Terminal Railroad Association of St. Louis and the St. Louis Merchants' Bridge Terminal Railway, going to the Chicago, Rock Island & Pacific in February, 1904, as supervisor of mails. From April to October of that year he was superintendent of transportation of the St. Louis & San Francisco. In April, 1905, he was appointed superintendent of terminals of the Missouri Pacific at St. Louis and in February, 1908, was promoted to superintendent of transportation of that road and the St. Louis, Iron Mountain & Southern. He was made general superintendent of transportation in January, 1913, and three months later was elected first vice-president of the Texas & Pacific, with headquarters at New Orleans, La. Mr. Kearney held the latter office when he was appointed receiver of the



E. F. Kearney

Wabash a few weeks ago, and last week he was elected president of that road, as above noted.

Verne M. Alexander has been appointed assistant to the president of the Chicago & Alton, with office at Chicago, Ill. He was born at Niagara Falls, Ontario, on November 19, 1887, and



V. M. Alexander

was educated in public and high schools at Lisbon and Cleveland, Ohio. He began railway work as messenger for the Western Union Telegraph Company and the Erie Railroad at Lisbon, Ohio, in June, 1901, and was successively yard clerk, freight received clerk and cashier at the same place until February, 1903; from February, 1903, to June, 1905, he was secretary to division freight agent and traveling freight agent for the same road at Youngstown, Ohio; June, 1905, to October, 1905, secretary to assistant general freight agent of the New York, Chicago & St. Louis, Cleveland, Ohio; October, 1905, to June, 1906, he took an advanced educational course at Central High School; June, 1906, to August, 1909, secretary and cashier of F. L. Fuller & Co., bankers and dealers in municipal and corporation securities, Cleveland, Ohio. During the last four months of 1908 he was associated with Tom L. Johnson (then mayor of Cleveland) in adjusting financial affairs of various companies at Lorain, Ohio. From September, 1909, to June, 1912, he was statistician to B. A. Worthington, first vice-president, general manager and receiver of the Wheeling & Lake Erie; and from July, 1912, to February, 1915, on staff of the president, Chicago & Alton at Chicago. On March 1, he was appointed assistant to president of the same road.

### Operating

John T. McShane, chief dispatcher for the Chicago, Burlington & Quincy at Omaha, Neb., has been appointed trainmaster at McCook, Neb., and J. E. McManus succeeds Mr. McShane.

B. C. Byers, superintendent of the Indianapolis Terminal division of the Cleveland, Cincinnati, Chicago & St. Louis, at Indianapolis, Ind., has been appointed superintendent of the St. Louis division, with office at Mattoon, Ill., vice Hadley Baldwin, promoted, and F. N. Reynolds succeeds Mr. Byers.

W. R. Cahill, superintendent of the Nebraska division of the Union Pacific, with headquarters at Omaha, Neb., has been retired under the pension rules of that company. W. B. Jeffers, superintendent of the Wyoming division at Cheyenne, Wyo., succeeds Mr. Cahill, and George Brophy, trainmaster at Ogden, Utah, succeeds Mr. Jeffers.

Andrew Alfred Woods, whose appointment as superintendent of the New Orleans & Northeastern, with headquarters at New Orleans, La., has already been announced in these columns, was born on March 2, 1876, at New Orleans. He graduated from the School of Engineering at Tulane University and subsequently took a post-graduate course in engineering at the same university. His first railway work was as a rodman on the New Orleans & Western, now a part of the New Orleans Terminal Company. From June, 1896, to July, of the following year, he was a draftsman in the maintenance of way department on the New Orleans & Northeastern, and then for six months was draftsman in the mechanical department of the same road. He then served as draftsman and inspector on bridge pier construction on the Alabama & Vicksburg and the Vicksburg, Shreveport & Pacific, until September, 1899, when he was appointed assistant engineer in the maintenance of way department of the New Orleans & Northeastern. From November, 1901, to July, 1913, he was resident engineer in charge of maintenance of way on the Alabama & Vicksburg and the Vicksburg, Shreveport & Pacific. He was appointed resident engineer in charge of maintenance of

way, on the New Orleans & Northeastern in July, 1913, which position he held at the time of his recent appointment as superintendent of the same road as above noted.

#### Traffic

D. L. Ogg has been appointed commercial agent of the Cincinnati, Hamilton & Dayton at Ironton, Ohio.

A. A. McKowen has been appointed division freight and passenger agent of the Wabash, with headquarters at Des Moines, Iowa, succeeding William Clapper, resigned.

J. E. Johanson, assistant general freight agent of the Rock Island Lines at Little Rock, Ark., has been appointed general freight agent, with headquarters at that point.

A. C. Tummy, assistant general freight agent of the Chicago, Indianapolis & Louisville, has been appointed general freight agent, with office at Chicago, succeeding W. T. Webster, resigned. R. B. Robertson, division freight agent, has been appointed assistant general freight agent to succeed Mr. Tummy.

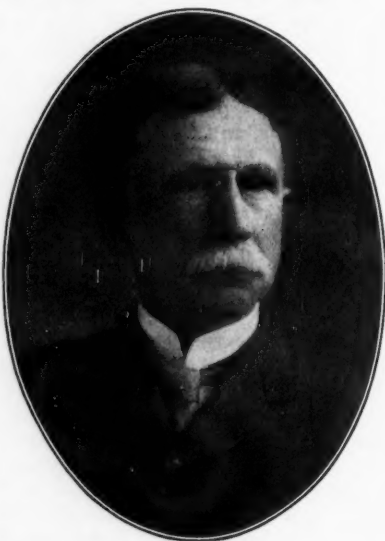
The following changes are announced in a joint circular issued by the St. Louis & San Francisco and the Chicago & Eastern Illinois: Charles A. Forrest, commercial agent at Atlanta, Ga., has been appointed general agent at that point and the former office has been abolished; C. S. Hall, commercial agent at Cincinnati, Ohio, has been transferred to Cleveland, Ohio, in a similar capacity, and F. A. Edmondson succeeds Mr. Hall.

#### Engineering and Rolling Stock

H. M. Church, division engineer of the Baltimore & Ohio at Philadelphia, Pa., has been appointed division engineer of the Baltimore division, with headquarters at Baltimore, Md., succeeding W. I. Trench, deceased.

George P. Smith, chief engineer of the Cleveland, Cincinnati, Chicago & St. Louis and the Peoria & Eastern, has been appointed consulting engineer, with headquarters at Cincinnati, Ohio. C. A. Paquette, chief engineer maintenance of way, succeeds Mr. Smith, with office at Cincinnati, and will be in charge of construction and maintenance. The office of chief engineer maintenance of way is abolished. Hadley Baldwin, division superintendent at Mattoon, Ill., has been appointed assistant chief engineer, with office at Cincinnati. Effective March 1.

Joseph Thomas Richards, consulting engineer of maintenance of way, of the Pennsylvania Railroad, with office at Philadelphia, Pa., retired under the pension rules of the company on March 1. He was born near Rising Sun, Cecil county, Md., on February 12, 1845, and was educated at West Nottingham Academy. He entered the service of the Pennsylvania Railroad in August, 1869, as rodman and transitman at Altoona, Pa. In June of the following year he was appointed supervisor main line, Harrisburg to Newport, and from October, 1871, to March, 1873, was chief engineer of construction and superintendent of various minor railroads in Maryland. He was then chief of locating engineers, making several surveys over the Allegheny mountains for an outlet for the Bedford & Bridgeport. In May, 1874, he became mining engineer in the service of the Cambria Iron Company, Johnstown, and returned to the service of the Pennsylvania Railroad in March, 1875, as supervisor on the main line from Newport to Granville. About a month later, he was promoted to assistant engineer, maintenance of way, and from June, 1877, to March, 1883, was principal assistant engineer of the United Railroads of New Jersey division, and then, for over two years, was assistant to the chief engineer, becoming assistant chief engineer of the Pennsylvania Railroad on June 24, 1885. When a



J. T. Richards

change was made in the organization in March, 1893, he became engineer of maintenance of way; in June, 1903, he was appointed chief engineer of maintenance of way, and since June, 1913, was consulting engineer, maintenance of way, of the same road. Mr. Richards also was chairman of several committees for working out the plans for the New York and Washington stations and yards.

#### Purchasing

The office of William Wibel, assistant purchasing agent of the National Railways of Mexico at New York, has been closed on instructions received from Mexico.

#### OBITUARY

H. H. Brand, commercial agent of the Atlantic Coast Line, died on February 27, at Sumter, S. C.

J. J. Hughes, roadmaster of the St. Louis Southwestern at Mount Pleasant, Tex., died suddenly on February 26.

Nathan Hopkins Heft, formerly electrical engineering adviser of the New York, New Haven & Hartford, died on February 25, at Bridgeport, Conn.

W. D. Herring, general claim agent of the Sunset-Central Lines, with headquarters at Houston, Tex., died suddenly on February 22, aged 57 years.

M. L. Robbins, formerly from 1892 to 1908, general passenger agent of the Houston & Texas Central, died in Houston, Tex., on March 3, at the age of 64.

Tracy W. Niles, formerly superintendent of the Detroit division of the Lake Shore & Michigan Southern, at Detroit, Mich., died on February 25, after a long illness, at his home in Buffalo, N. Y., at the age of 64.

G. S. James, trainmaster of the Seaboard Air Line, at Tampa, Fla., while riding on the footboard of a switching engine in the yards at Tampa on February 25, was thrown off the engine and fell on the track, receiving injuries from which he died. The footboard struck a guard rail at the entrance of a bridge.

Thomas Swinyard, president of the Dominion Telegraph Company, died on February 25, in New York City, at the age of 83. He was born in England, and for a time served on the London & North Western. In 1862 he went to Canada as general manager of the Great Western Railway, and subsequently was active president of the Detroit & Milwaukee, both now included in the Grand Trunk system. He also served as the Dominion government commissioner for organizing the Prince Edward Island Railway and for a time was vice-president of the New York, Ontario & Western. In 1897 he represented the Dominion government in the arbitration suit with the Canadian Pacific.

John W. Addis, formerly for 19 years superintendent of motive power of the Texas & Pacific, died at Marshall, Texas, on February 25. He was born on March 13, 1851, at East Liberty, Pa., and after learning the trade of machinist entered the shops of the International & Great Northern, at Palestine, Tex. In 1882 he went to the Marshall shops of the Texas & Pacific, and left that road to become general foreman at the Tyler shops of the St. Louis Southwestern. He was transferred later to the Pine Bluff shops, of which he had charge, and was then for about four years master mechanic at the Gouldsboro shops of the Texas & Pacific. About 1892 Mr. Addis succeeded A. G. Douglass as superintendent of motive power and rolling stock of the Texas & Pacific at Marshall, and remained in the service of that road until June, 1911.

W. W. Borst, formerly receiver for the Denver, Lakewood & Golden, died at his home in Denver, Col., on February 22, aged 76 years. Mr. Borst entered railway service in April, 1867, with the Union Pacific. From September, 1871, to September, 1879, he was superintendent of the Denver & Rio Grande, and was then consecutively general agent of the Atchison, Topeka & Santa Fe and superintendent of the Western division, returning to the Denver & Rio Grande in November, 1883, as superintendent of the First division. He remained with the Rio Grande until December, 1888, as superintendent and assistant general superintendent. In November, 1889, he became superintendent of the Denver Consolidated Electric Company, and from August, 1896, to 1905, was receiver for the Denver, Lakewood & Golden, retiring from active railway service on the latter date.



## Equipment and Supplies

### LOCOMOTIVE BUILDING

THE CHICAGO, MILWAUKEE & ST. PAUL has ordered nine 260-ton electric locomotives from the General Electric Company, for operation on the second engine division of the new electrical line from Three Forks, Mont., to Harlowton.

### CAR BUILDING

THE NEW YORK, WESTCHESTER & BOSTON is in the market for 15 passenger cars.

SPANG, CHALFANT & COMPANY, Pittsburgh, Pa., have ordered 6 hopper and 10 flat cars from the Pressed Steel Car Company.

THE MINNEAPOLIS, ST. PAUL & SAULT STE. MARIE has ordered six postal cars from the American Car & Foundry Company.

THE CAROLINA, CLINCHFIELD & OHIO recently purchased a 40-ft., 200 hp. concrete mixing car for lining tunnels, from the McKeen Motor Car Company, Omaha, Neb.

THE CHICAGO, WAUKEGAN & FOX LAKE TRACTION COMPANY has ordered one 55-ft., 200 hp. combined passenger-baggage motor car from the McKeen Motor Car Company, Omaha, Neb.

THE IRISH RAILWAYS IN WARTIME.—The Irish railway companies are not under the government control, and hence all movements that are made for the naval and military authorities are paid for. From August 5 to 21 the Great Southern & Western operated 172 special trains, which carried 60,000 men, 10,000 horses, 200 baggage cars and 1,100 cars of guns.

NEW NORWEGIAN ELECTRIFICATION.—The electrification of the railway between Kiruna and the Riksgränsen station on the Norwegian frontier has now been completed, and operation was begun on January 19. Loaded trains of forty cars are run at a speed of 36 miles an hour; previously the highest speed allowed was only 18. The work has been successfully carried out, although accompanied by some mishaps, among which may be mentioned that the telegraph line from Sweden to Narvik has been put out of service altogether, due to induction effects. Steps have now been taken to lay a double telegraph line. The telephone line is a double line supplied with discharging poles and transformers, and the induction on this is very small.

AUSTRALIAN RAILWAYS.—According to a report issued by the high commissioner for Australia good progress is being made in the construction of the Transcontinental Railway, which is to link up the railways of Western Australia with those of the eastern states. During the four weeks ended December 19, 34¼ miles of plate-laying was accomplished. This is a record for this line, and, so far as is known here, for railways in Australia. It is anticipated that still further progress will be made in the current year. At the West Australia end the head of the road now stands at 152 miles; the earthworks have been completed to the 157th mile, and the telegraph line to 148 miles, 18 miles having been erected during the month. In the South Australian section the head of the road has reached 156 miles. The earthworks extend to about 160 miles, and the telegraph line to 149 miles, 16 miles having been erected during the month. At the western end there are some 638 men employed, and at the eastern end 1,432 men. The total number of miles of line laid is 308. This is exclusive of a considerable mileage of sidings, yards, etc. Good water has been struck in wells between 158 and 185, in the South Australian section, and boring for water is being continued at both ends in advance of construction. One large reservoir dam is almost finished in the eastern section, and two others are under construction, and also one in the western section. The news of the Pine Creek-Katherine River Railway, in the northern territory, is that the clearing has been completed for about 35 miles, the earthworks for 9 miles, and the waterways for 11 miles, some 228 men being employed. Rails and other material are now being landed at Port Darwin.—*Engineering.*

## Supply Trade News

The Superior Car Metal Roofing Company, Chicago, Ill., has recently been incorporated for \$25,000 for the purpose of manufacturing and selling car roofs, doors, locks, etc. The incorporators are William H. Slatten, William F. Nolan and E. A. Albright.

The Greenfield Tap & Die Corporation, Greenfield, Mass., composed of the Wells Brothers Company, the Wiley & Russell Manufacturing Company and the A. J. Smart Manufacturing Company has discontinued the Wells Brothers Company store in New York, at 107 Lafayette street, and now maintains one store at 28 Warren street, the former Wiley & Russell store. The Wiley & Russell Manufacturing Company's store in Chicago at 545 West Washington Boulevard has also been discontinued and the stores consolidated at 13 South Clinton street, the former Wells Brothers store. The consolidation of the stores in this manner is expected to bring about a decided improvement in the service offered by the several companies.

Wellington B. Lee, whose appointment to the position of vice-president of the Track Specialties Company, Inc., New York, was announced in the *Railway Age Gazette* of last week, was



W. B. Lee

formerly with the Ramapo Iron Works, Hillburn, N. Y., and was with that company 24 years. Mr. Lee was born January 29, 1867, at Wilmington, Del. He was educated in the public schools of that city, and received a degree of civil engineer in 1885 at the Polytechnic College of the State of Pennsylvania, from which, after serving an apprenticeship of one year with a local surveyor, he became a clerk to the chief engineer of the Wilmington & Northern. One year later he obtained a position in the maintenance of way department of the Pennsylvania Railroad at Wilmington,

Del., and served on that railroad for three years. He then entered the service of the Ramapo Iron Works and served as chief draftsman of that company for 12 years, after which he was an engineering salesman for 12 years more. He is a member of the American Society of Civil Engineers, and also of the Engineers' Club of New York.

Two suits by the Safety Car Heating & Lighting Company, New York, against the United States Light & Heating Company, Niagara Falls, N. Y., have recently been decided in favor of the defendant by Judge Hazel in the Western District of New York. These suits were on the W. I. Thompson Patent No. 881,743, March 10, 1908, on a dynamo suspension for car lighting, and W. I. Thompson Patent No. 926,518, June 29, 1909, on a lighting system, commonly referred to as the carbon disk regulator. In each case the patent was held invalid and the bill of complaint dismissed. The court held that the predecessors of the United States Light & Heating Company had installed dynamo suspensions and the carbon disk regulator substantially as described and claimed in the patents, on their own apparatus on the New York Central prior to the dates of the patents.

William Wharton, Jr., & Co., a subsidiary of the Taylor-Wharton Iron & Steel Company, announce that remarkable progress has been made in the erection of the new plant at Easton, Pa., and that they expect to move into new quarters during the present year. The tract on which the plant is located comprises about 50 acres just outside the city limits of Easton, and when

all the buildings will have been completed about 10 acres will be under roof. The main shop is over 450 ft. square and will be used exclusively for the manufacture of special track work for electric and steam railways. Other buildings are: Power house, foundry, pattern shop, forge shop and the office building. The plant has been designed to take care of the manufacturing now carried on at the two plants of the Wharton company located at Philadelphia, Pa., and Jenkintown; also the forging business of the Tioga Steel & Iron Company, which is also a subsidiary of the Taylor-Wharton Iron & Steel Company.

In the *Railway Age Gazette* of last week it was announced that Jed O. Gould, general superintendent and works manager of the Gould Coupler Company at Depew, N. Y., had died on Friday, February 19, in the German Deaconess hospital at Buffalo. Mr. Gould was a brother of Charles A. Gould, the present president of the Gould Coupler Company, and had served as general superintendent and works manager for many years. He was born in Batavia, N. Y., on August 13, 1857. As a young man he moved to Buffalo where for several years he was superintendent of the money order department at the Buffalo post office. He resigned from that position, however, when the Gould forge was established at Black Rock some thirty years ago to take an active interest in that plant.

When the plant was moved to Depew, he became general superintendent and works manager, which position he held until the time of his death. Mr. Gould is survived by his wife, Jane C. Gould and by three sons, James, Raymond and Chester, all of Buffalo.

In this column last week there was announced the death of William F. Gurley, president of W. & L. E. Gurley, Troy, N. Y., at Atlantic City on Wednesday, February 17. Mr. Gurley was one of the most highly esteemed residents of the city of Troy. He was born at that place on June 11, 1860. He received his early education there and graduated from Williams College in 1882. He immediately entered the Gurley works and obtained a practical knowledge of the business. When William Gurley, his uncle, died, William F. Gurley advanced to a leading position in the firm, and on its incorporation became its president, a position which he held until his death. Mr. Gurley was prominent in the public life of Troy. He was the first president of the Troy Chamber of Commerce, and was an ex-officio member of the board of directors of that organization. He was one of the three commissioners of education of the city and took a great interest in the welfare of the public schools. He was president of the board of trustees of the Emma Willard school, one of the leading educational institutions for women, and president of the board of trustees of the Troy Orphan Asylum; he was also prominent in church work and was a trustee in a number of church and charitable institutions.

#### Baldwin Locomotive Works

The recently issued annual report for the Baldwin Locomotive Works for the year ended December 31, 1914, shows decidedly what an exceedingly poor year 1914 was for the railway supply companies. The gross sales of the company for the year were \$13,616,163, as compared with \$37,630,969 in 1913, or almost two-thirds less. The manufacturing and administrative expenses, depreciation, etc., were \$13,295,554, as against \$33,744,494 in 1913, so that the manufacturing profit was only \$320,609 as compared with \$3,886,484 in 1913. There was other income of \$661,144, however, including the dividends of the Standard Steel Works, so that the total income was \$981,753. Interest was paid on bonds, etc., of \$631,523, and the net profit was \$350,229, as against \$4,017,800 in 1913. The company, nevertheless, paid the

usual dividends of \$1,400,000, or 7 per cent, on its preferred stock and \$400,000, or 2 per cent, on its common stock, the result being that the surplus carried forward was but \$3,438,021 as compared with \$4,887,791 on December 31, 1913. The surplus on December 31, 1912, however, was \$2,669,990. The report contains the following comment: "During the latter part of 1913 and the first half of 1914 the falling off of railroad revenues, due to the unfavorable attitude of the Interstate Commerce Commission, caused a general cessation of purchases of railroad equipment, and this condition was made more acute by the reduction of railroad revenues resulting from the slowing down of business, due largely to the adoption of lower tariff rates. During the last half of the year 1914 these unfavorable conditions were further affected by the paralysis of finances and of business which followed the breaking out of the war in Europe. The stress of competition forced the prices of orders obtained close to the cost of production. It is obvious that under these conditions only extreme economies made it possible to carry the overhead expenses and pay interest on the bonded indebtedness."

#### American Steel Foundries

The annual report for the American Steel Foundries for the year ended December 31, 1914, contains the following statements:

"Perhaps the most comforting statement that can be made concerning the operations of the company for the year is that after spending \$913,085 for repairs and maintenance, charging \$231,456 to depreciation, and paying out \$343,680 in dividends, we ended the year with net assets practically the same as they were at the beginning, the actual decrease being less than \$8,000. The balance sheet will show, however, a decrease in surplus of \$575,162, and while \$567,263 of this is offset by a reduction in our bond and debenture indebtedness, or provision therefor, the fact remains that our surplus has been reduced from \$1,243,149 to \$667,987, and this is the figure that must be kept in mind."

The company's gross sales in 1914 were \$11,125,091 as against \$17,425,942 in 1913. The operations for the year were at a rate of approximately 50 per cent of the rated capacity of the plants, as against 80 per cent for 1913. The profits, after deducting general, selling and administrative expenses, were \$637,503 as compared with \$2,031,272 for the preceding year. After deducting \$231,456 for depreciation, and adding miscellaneous income of \$87,159 the earnings were \$493,206. Deducting from this, interest on bonds and debentures outstanding, and providing for bond redemption and debenture retirement, there was a net loss of \$231,482.

The company's balance sheet for December 31 shows capital assets of \$20,601,908, inventories of \$2,034,953, accounts and bills receivable of \$1,675,785, and cash \$1,547,811. The company's capital stock is now \$17,184,000, and there are bonds outstanding of \$4,819,100. Accounts payable on December 31 totaled \$689,017. The reserve, as noted above, was \$667,987. President Lamont states in the report: "It is difficult to say much as to the present year; one guess is as good as another. We are showing small gains in tonnage at some of the plants, and there is more business in prospect now than there has been at any time since the outbreak of the war, but actual orders materialize very slowly. If the crop situation develops favorably we may be operating on a satisfactory basis during the second six months of the year."

#### TRADE PUBLICATIONS

**TILE ROOFING.**—"The Indestructible Roof" is the title of a 68-page booklet issued by the Federal Cement Tile Company, Chicago, Ill. It illustrates and describes the detail construction of standard roof tile, and shows clearly the process of erection. It also illustrates numerous installations using this product.

**CONCRETE WORK.**—"The First Lessons in Concrete Work" is the title of a 40-page booklet just issued by the T. L. Smith Company, Milwaukee, Wis. This book defines concrete, gives the proportion of ingredients in the various mixtures used, and explains how the percentage of voids in any material may be found. The design and construction of forms for foundations, walls, etc., are also explained, and the placing of concrete in cold weather, the methods of rendering it waterproof, the cost of placing, etc., are discussed. It also describes and illustrates the various Smith mixers, giving the horse power required to operate a machine of any particular size, etc.



## Railway Construction

**BUFFALO, ROCHESTER & PITTSBURGH.**—An officer writes that the proposed improvements to be carried out near Silver Springs, N. Y., calls for the construction of a new section of road about 1,000 ft. long which will permit the elimination of a timber structure over the present highway.

**CANADIAN NORTHERN.**—See Canadian Pacific.

**CANADIAN PACIFIC.**—The committee of the Canadian parliament has under consideration a bill which provides for the ratification of an agreement between the Canadian Pacific and the Canadian Northern for the joint use and ownership of the lines and improvements now existing or to be built in North Toronto, Ont., on the present right-of-way of the Canadian Pacific, from Dufferin street in the west to the eastern end of the bridge across the west Don at Eglinton avenue and Leslie street, over 4.5 miles. In addition to the plans for the elevation of tracks, from Dufferin street to Summerhill avenue at Reservoir Park, east of Yonge street and the construction of a station at Yonge street, the agreement calls for increased trackage, common and joint, east of Summerhill avenue and over to the west Don about two miles. The Canadian Northern is to have its freight yards at Yonge street, east of the street and north of the Canadian Pacific, and its division yard at Leaside; the agreement is being made to permit the Canadian Northern to reach these yards and the new union station.

**FORT MYERS, MARCO BAY & MIAMI.**—Contracts will be let as soon as a complete survey is made to build from Ft. Myers, Fla., south along the west coast of Florida via Naples, and Marco bay to Everglade, thence east across the southern part of Florida to the east coast at Miami, about 150 miles. Preliminary surveys were started last year, and engineers will begin work from Ft. Myers this month to make a complete survey for the proposed line. There will be about 15 miles of trestle work which later is to be filled in. The plans also call for constructing docks for handling coal and lumber at Marco bay, where there is a depth of from 18 to 32 ft. of water. The company expects to develop a traffic in lumber, fruit, vegetables, fish and passengers. The West Coast Construction & Development Company is to be organized to build the line. W. J. Hilands is trustee, Ocala, Fla., and W. B. Clay, chief engineer, Arcadia. (See Florida Roads, January 29, p. 211.)

**JACKSONVILLE-MIDDLEBURG (Electric).**—Right of way has been secured, it is said, for the electric line from Jacksonville, Fla., southwest to Middleburg, about 25 miles, and grading work is now under way on the section from Jacksonville Heights to Jacksonville. When this section is finished work will be started on the Middleburg end. Financial arrangements have been made to build the first ten miles, and application will soon be made for a charter. A. W. Mackinlay, general manager and chief engineer, Jacksonville, Fla. (See Florida Roads, January 29, p. 211.)

**McCONNELLSBURG & FT. LOUDON (Electric).**—A charter has been granted to this company in Pennsylvania with \$60,000 capital. The plans call for building an electric line from McConnellsburg, Pa., east to Ft. Loudon, about ten miles. E. J. Post, president, Washington, D. C., and G. A. Harris, B. C. Lamberson, J. L. Patterson, McConnellsburg; H. A. Duffy and D. H. Patterson, Webster Mills, are the incorporators. (February 19, p. 350.)

**OGDEN, LOGAN & IDAHO (Electric).**—The construction work on the extension from Lewiston, Utah, to Preston, Idaho, will be completed about March 15, 1915. This company also expects to construct a line from Wellsville, Utah, to Brigham City, some time during this year. This road will connect the company's north and south properties.

**OKLAHOMA ROADS.**—A charter has been granted the Alva, Buffalo & Colorado for the purpose of building a line from Rosston, Okla., to Buffalo, a distance of 20 miles. Efforts are now being made to secure subscriptions.

**PENNSYLVANIA RAILROAD.**—The report of this company for the year ended December 31, 1914, shows that the work on the improvement of the passenger facilities in and around Philadelphia, Pa., was continued. The five-track reinforced concrete and stone arch bridge of the Connecting Railway over the Schuylkill river at the Girard avenue entrance to Fairmount Park has been completed and placed in operation and the old double track bridge removed; the work at North Philadelphia has been finished with the exception of remodeling the passenger station. The electrification of the main line from Broad street station, Philadelphia, to Paoli, is progressing rapidly, and the work from Paoli to West Philadelphia is almost completed, including the sub-stations. The pier properties on the Delaware river south of Washington avenue and at Walnut street, Philadelphia, were improved during the year by the erection of new sheds and the enlargement of other facilities. The reconstruction of a number of bridges at Ernest; over North Broad street, North Philadelphia; at High-spire; Auburn and Norristown, and at Dornock Point was also carried out, and the masonry work for the double track steel bridge over the Allegheny river between Kiskiminetas Junction and Freeport has been completed, and the superstructure is being erected. The bridge at Phoenixville is being rebuilt and will be completed in 1915. On the new six-track section of the New York division, between Colonia and Bay Way, just west of Elizabeth, N. J., work was continued during the year, this consisted principally of the elevation of the four original running tracks. The greater part of this work has been completed and placed in operation, and it is expected that the remaining sections will be finished in the spring of 1915. New freight stations were placed under construction at Harrisburg, Pa., and Allegheny, which will be completed in 1915. The passenger and freight facilities at Elizabethtown, Altoona and Brookville are also being enlarged to handle increased traffic. The Sugar Camp branch, Tyrone division, the Shade Creek branch, Pittsburgh division and the Homer & Cherry Tree branch, Conemaugh division were extended to reach new coal openings. Work was finished on the Yukon branch extension from Bells Mills to Cowansburg, Pittsburgh division, and a branch is being built from Gilberton to Mahanoy Plane, Schuylkill division, to develop additional coal traffic. Work was continued on the elimination of grade crossings at Homewood avenue, Pittsburgh, and in the borough of Wilkinsburg, Pittsburgh, at the latter place a new passenger station is being constructed; it is expected that this work will be finished in 1915. The elimination of grade crossings, change of grade and the erection of a new passenger station in the city of Johnstown is under way, but will not be completed before 1916. The change of line and grade on the Renovo division at Cameron and Horn, and the construction of a second track between Corry and Lovell, have been completed. Surveys and many of the plans have been completed for the new line and the elimination of grade crossings in South Philadelphia to be carried out jointly by the Pennsylvania Railroad, the Philadelphia, Baltimore & Washington, the Baltimore & Ohio and the city of Philadelphia. Work was continued on the New York Connecting Railroad; the foundations and masonry of the East river four-track arch bridge have been completed to the track level, and work is now under way on the erection of the steel arch over the river. The viaducts and approaches on Long Island and on Ward's and Randall's islands are about finished, and progress has been made on the remaining sections of the line. The erection of the double track steel bridge over the Delaware river south of Trenton is proceeding. This bridge is part of the proposed New York division double-track relief line known as the Pennsylvania & Newark which will extend from the yard at Morrisville, Pa., to Colonia, N. J., about 40 miles, where a connection is to be made with the six-track system on that division, and there will also be branches connecting with the Trenton and New York divisions near Trenton, N. J. The revision of the grades and alinement and the construction of additional tracks and passing sidings on the Western New York & Pennsylvania between Oil City and Buffalo via Chautauqua was continued during the year and will shortly be completed.

**SULPHUR SPRINGS, QUITMAN & GREAT NORTHERN.**—Plans are being made to build a railway, it is said, from Quitman, Tex., northwest to Sulphur Springs, about 30 miles. Large bonuses have been raised in aid of the project by residents of both Quitman and Sulphur Springs.

## RAILWAY STRUCTURES

COLEMAN, TEX.—(See Pampa, Tex.)

DECATUR, ALA.—A bill to authorize the North Alabama Traction Company, a corporation organized in Alabama, to build a combined railroad and highway bridge over the Tennessee river at Decatur, has been passed by the lower house of Congress, and is reported in the Senate.

FREEPORT, TEX.—The Houston & Brazos Valley is interested in the building of a combination railroad and roadway bridge that is now being constructed at this point.

HUNTINGTON, W. VA.—Plans are being made for an office building to be built at Eighth street and Fourth avenue in Huntington for the Ohio Valley Electric Railway. The cost of the structure will be about \$25,000.

MACON, GA.—An agreement has been reached between the Central of Georgia and the city of Macon, whereby the railroad company will erect a new depot at that point. The city in turn will make certain concessions to accommodate rearrangements of tracks. Only tentative plans have been prepared and no time has been set for construction work to begin.

NEW YORK.—The New York Public Service Commission, First district, has approved the proposed award by the New York Municipal Railway Corporation for the construction of nine stations on the Sea Beach line, to Post & McCord, Inc., the lowest bidders, who offered to do the work for \$331,163. The Sea Beach line is a reconstructed four-track railroad, from a junction with the Fourth avenue subway at Sixty-fifth street, in the borough of Brooklyn, to Coney Island.

PAMPA, TEX.—The Atchison, Topeka & Santa Fe has prepared plans and is about to award contracts for the construction of a small brick passenger station. The estimated cost is \$10,000. This company will build a similar structure at Coleman, Tex.

PHILADELPHIA, PA.—The Arthur McMullin Company, New York City, submitted the lowest bid to build the reinforced concrete bridge to carry Broad street over the tracks of the Pennsylvania Railroad, the Baltimore & Ohio and the Philadelphia Belt Line. This firm offered to do the work for \$237,600. This work is part of the improvements to be carried out jointly by the city of Philadelphia and the railroads for the elimination of grade crossings in South Philadelphia. (February 26, p. 390.)

SARATOGA SPRINGS, N. Y.—Bids will be asked for about April 1, by Ludlow & Peabody, New York, for building a one-story terminal station at Saratoga Springs for the Hudson Valley Railway. The proposed structure is to be of brick and stucco construction and will cost about \$30,000.

SHARON, PA.—Plans are being made by Mercer county commissioners to build a bridge over the Shenango river at State street in Sharon. The bridge will carry tracks for the operation of street railway cars.

LONDON TRAFFIC FIGURES.—In the recently issued report by the London Traffic Branch of the Board of Trade, there is a table showing approximately the number of passengers carried in the area of Greater London by local railways, tramways and omnibuses in the last 10 years. For 1913 the numbers were, by local railways, 462,019,537; tramways (approximate), 811,397,317; omnibus, 733,931,201. The corresponding figures for 1909 were 410,744,610 by railways, 687,138,908 by tramway, and 311,000,000 by omnibus. How much the traffic by road is growing at the expense of traffic by rail may be judged from the fact that in 1909, 60 per cent went by road and 40 per cent by rail, while in 1913 some 68 per cent went by road and only 32 per cent by rail. The increase is mainly due to motor 'busses, of which 3,522 were licensed in 1913, as against 1,180 in 1909. Long-distance running by these vehicles is increasing, as is shown by the week-day services operating on seven routes of over 15 miles in length, ranging from the 15.9 miles (Golders Green and St. Albans) to the 19.41 miles (Stockwell and Reigate). During the same period the tramcar licenses have risen only from 2,198 to 2,786, and the mileage of new tramways (in single track) in Greater London, from 601.31 miles to 655.94 miles. Since 1907 the route-mileage of railways open for passenger traffic in Greater London has advanced only from 667.4 to 669.2 miles.

## Railway Financial News

BOSTON & MAINE.—The holders of the notes which were due on March 2 have consented to the extension to September 2, 1915. Note holders had the option of extending all of their notes or of extending part of the notes and taking 35 per cent in Maine Railways notes. Of the \$22,626,000 notes due, holders of \$22,085,000 agreed to an extension, and of these, holders of \$14,515,000 notes elected to take the Maine Railways' notes.

CANADIAN PACIFIC.—In explaining the bill now before the Canadian Parliament for the creation of the Canadian Pacific Ocean Services, Ltd., Sir Thomas Shaughnessy is quoted as saying:

"The company is operating fleets of steamships on the Atlantic and Pacific oceans, and on the Pacific coast, as well as on the Great Lakes and other inland waterways of Canada. These latter are connecting links between different sections of the railway line, and are, therefore, essentially a portion of the railway transportation system, and it is not proposed to change their status. The ocean fleets are, however, in a different class, engaged in competition with outside fleets, plying between Canada and other portions of the world. The company proposes to transfer these ships to a steamship company, with which the business relations will be the same as they are with outside steamship lines that exchange traffic with the railway company.

"Heretofore, all expenditures for the acquisition and construction of these ocean steamships were made by the railway company and included among the liabilities in its balance sheet. Hereafter, it is proposed that the steamship company shall itself secure the requisite money for these purposes by the issue of its own securities.

"The ownership and control of the steamship company will remain with the Canadian Pacific Railway Company, but the management and operation of the steamship lines will be vested in the board of directors of the Canadian Pacific Ocean Services, Ltd.

"It is only another step in the direction of eliminating from the direct operations of the railway company items that do not relate to the railway property itself."

DENVER & SALT LAKE.—Holders of notes of the Denver & Salt Lake to the extent of \$163,962 have agreed to take first mortgage treasury bonds at 75 in payment. An issue of \$300,000 two year, 6 per cent notes secured by the deposit of \$600,000 first mortgage bonds, are to be sold to provide current funds.

MISSOURI PACIFIC.—The proxy committee representing Kuhn, Loeb & Company and associates have announced that they have received proxies for the annual meeting of March 9 from more than a majority of the stock, and that they will vote for the following as directors: N. F. Brady, B. F. Bush, Newcomb Carlton, Edward A. Faust, A. J. Hemphill, William H. Lee, Edgar L. Marston, E. J. Merrill, Finley J. Shepard, Cornelius Vanderbilt, R. Lancaster Williams, W. H. Williams and C. Minot Weld.

NEW YORK, NEW HAVEN & HARTFORD.—The railroad committee of the Connecticut General Assembly has reported favorably on the bill which authorized the New Haven to sell or pledge stock of the Boston & Providence and the Old Colony Railroad. This stock is now held in the New Haven treasury.

WESTERN PACIFIC.—The Equitable Trust Company, New York, has asked for the appointment of a receiver, the Western Pacific having decided not to pay the interest due March 1 on the \$50,000,000 first mortgage bonds. Warren Olney, Jr., chief counsel for the road has been named receiver.

RAILWAY OVER THE DESERT.—Large numbers of Syrian refugees who recently arrived at Alexandria report that the Germans are removing the rails between Lydda and Jaffa for the construction of a line on the route Sebastieh, Toulharem, Lydda and Gaza, and thousands of workmen are being employed on the work.



# ANNUAL REPORT

## THE PENNSYLVANIA RAILROAD COMPANY

GENERAL OFFICE, BROAD STREET STATION, PHILADELPHIA, PA.,

February 24th, 1915.

The Board of Directors herewith submit to the Stockholders of The Pennsylvania Railroad Company a synopsis of their Annual Report for the year 1914:—

### CONDENSED INCOME STATEMENT.

Railway operating revenues.....	\$181,184,822.32
Railway operating expenses.....	138,616,672.07
Net revenue from railway operations.....	\$42,568,150.25
Railway tax accruals.....	\$7,461,892.52
Uncollectible railway revenues.....	11,313.24
	<u>7,473,205.76</u>
Railway operating income.....	\$35,094,944.49
Non-operating income:	
Income from securities, accounts and sinking and other reserve funds.....	\$14,341,800.65
Rent income, etc.....	2,355,478.28
	<u>16,697,278.93</u>
Gross income.....	\$51,792,223.42
Deductions from gross income.....	17,701,458.60
Net income.....	\$34,090,764.82
Disposition of net income:	
Income applied to sinking and other reserve funds.....	\$1,785,242.65
Dividend of six per cent.....	29,952,186.00
Income appropriated for road and equipment, improvements, etc.....	2,230,335.64
	<u>\$33,967,764.29</u>
Balance transferred to credit of Profit and Loss.....	\$123,000.53

Operating results of Pennsylvania Railroad Company and Northern Central Railway Company for the year ended December 31st, 1914, compared with the year 1913.

The lease of the Northern Central Railway having become effective, the revenues and expenses from the operation of its lines are included in the above Income Statement from July 1st, 1914.

For the purpose of proper comparison, the statement below shows the combined operations of your lines and of the Northern Central Railway lines for the entire year 1914 compared with similar operations for 1913.

	1914.	Comparison with 1913— Increase.	Decrease.
Railway operating revenues.....	\$187,251,851.22		\$17,828,261.23
Railway operating expenses.....	144,292,242.91		13,705,175.10
Net revenue from railway operations.....	\$42,959,608.31		\$4,123,086.13
Railway tax accruals.....	\$7,689,523.47		\$151,330.42
Uncollectible railway revenues.....	11,313.24	\$11,313.24	
	<u>\$7,700,836.71</u>		<u>\$140,017.18</u>
Railway operating income.....	\$35,258,771.60		\$3,983,068.95

### CONDENSED GENERAL BALANCE SHEET.

DECEMBER 31ST, 1914.

<b>ASSETS.</b>	
<b>Investments:</b>	
Investment in road and equipment.....	\$481,553,513.69
Improvements on leased railway property since June 30th, 1907.....	16,294,103.39
Sinking funds.....	2,309,427.30
Miscellaneous physical property.....	2,026,833.23
Securities owned and advances to affiliated companies.....	350,493,097.97
Current assets.....	67,599,784.56
Deferred assets including insurance and other funds.....	28,962,923.19
Unadjusted debits.....	2,223,373.63
	<u>\$951,463,056.96</u>
<b>LIABILITIES.</b>	
Capital Stock.....	\$499,203,600.00
Premium realized on Capital Stock from January 1st, 1909.....	7,254,247.63
Bonded debt and other obligations.....	236,951,642.73
Current liabilities.....	35,743,697.79
Deferred liabilities.....	187,774.13
Unadjusted credits including accrued taxes and depreciation reserves.....	29,221,093.63
Corporate surplus:	
Additions to property through income and surplus since June 30th, 1907.....	73,184,541.87
Miscellaneous fund reserves.....	32,426,820.49
Sinking fund reserves, etc.....	5,412,283.22
Profit and Loss.....	31,877,355.47
	<u>\$951,463,056.96</u>

The number of tons of freight moved on the five general divisions east of Pittsburgh and Erie in 1914 was 135,296,035, a decrease of 19,912,743, or 12.83 per cent.; the number of passengers was 80,873,281, a decrease of 1,903,951, or 2.30 per cent.

The operating revenue of all lines east and west of Pittsburgh for the year 1914 was \$354,412,996.34, operating expenses \$288,803,807.84, and operating income, \$65,609,188.50, a decrease in operating revenue, compared with 1913, of \$38,022,947.71, and a decrease in operating income of \$5,373,852.58. There were 313,983,414 tons of freight moved on the entire system, being a decrease of 58,039,716 tons, and 183,031,295 passengers carried, a decrease of 4,463,150.

### GENERAL REMARKS.

#### MILEAGE.

The increase in the mileage of the lines directly operated was due chiefly to the lease of the Northern Central Railway.

#### INCOME STATEMENT.

Business conditions on your lines, as well as on other railroads, were unsatisfactory in the year 1914. The total operating revenues show a decrease of 8.69 per cent., compared with 1913, chiefly in the freight and passenger traffic, arising from unfavorable commercial and financial conditions, which in the last five months of the year were accentuated by the European War. The gross revenues and expenses include, since July 1, 1914, the operations of the Northern Central Lines under the lease to your Company, and they also include, in accordance with the revised Classification of Operating Revenues and Expenses of the Interstate Commerce Commission, effective since July 1, 1914, the results from Auxiliary Operations, for which separate accounting was previously required.

Express Revenue shows a decrease due to a reduction in express rates, and by reason of the operation of the Parcel Post. This will require some equitable adjustment of the contract with the Express Company, and offsets to some extent the increase in Mail Revenue.

Mail Revenue increased as a result of the quadrennial weighing, effective July 1, 1913. The manifest unfairness of weighing the mails, including the growing parcel post, only once in four years deprives the Company of revenue for the increased weights carried each year, and should be remedied by an annual weighing and an annual adjustment of pay.

The total Operating Expenses decreased 8.67 per cent., chiefly through enforced economies required by the loss of revenue and traffic. These were effected by a reduction in the use of materials and supplies, in the working forces of all departments, and in train and car mileage, and by deferring other expenses, but having in view at all times the preservation of the safety of your tracks, equipment and facilities. The increases in wages of engineers, firemen, conductors, and trainmen, under the Wage Arbitration awards, and other consequent wage adjustments, and the expense of complying with legislative enactments, prevented still further savings in expenses.

Railway Operating Income shows a decrease of \$3,087,538.68 compared with the results of the lines operated by your Company in 1913, but if the figures for 1913 used in comparison had also included the operations of the Northern Central Railway for that year, the Railway Operating Income for both Companies would have shown an aggregate decrease of \$3,983,068.95.

The Net Income for 1914 was \$34,090,764.82, a decrease of \$7,830,067.97, compared with the previous year: from which appropriations were made to Sinking and Other Reserve Funds; certain necessary additions and betterments were provided; cash dividends amounting to six per cent. were paid on your Capital Stock; and \$123,000.53 was credited to Profit and Loss account. The latter account has also been credited with \$5,669,379, the par value of the Northern Central Railway Company stock received as a 40% dividend and the cash dividends accrued thereon since January 1st, 1911; the extra cash dividend of 10% amounting to \$1,057,720 received on your stock holdings in that Company; also the proceeds received from the Manor Real Estate & Trust Company, which is owned by your Company, resulting from the sale, to the Susquehanna Coal Company of coal lands formerly leased to the Mineral Railroad & Mining Company, amounting to \$670,368.98 and with profits from sales of securities and sundry credits. Against this account has been charged \$3,186,031.38, representing construction and real estate expenditures on long term leased lines, especially the United New Jersey Railroad & Canal Company and Harrisburg, Portsmouth, Mt. Joy & Lancaster Railroad Company, the net income of your Company not being sufficient to provide the same; advances to Branch Lines for similar purposes, which were unable to meet the same out of their own resources, and advances for interest on, and retirement of, water trust certificates and expenditures on your water supply system; also the rental and leasehold settlement of the Northern Central Railway Company in the adjustment of the accounts under the lease from January 1st, 1911, involving a charge of \$1,343,510.83, so that the net amount credited to Profit and Loss account during the year was \$2,850,174.81.

#### LEGISLATION.

The increased scope and great burden of the duties and responsibilities imposed upon the Interstate Commerce Commission should now be followed by the amendment of the Federal laws from which its authority is derived. The Commission should be definitely empowered by specific provisions in these laws to strengthen the railroads, upon which the welfare of the Country so largely depends, so as to encourage the investment of private capital for the expansion of their facilities and services, and the preservation of their credit by means of reasonable rates which will accord with the higher costs and burdens placed on them in complying with statutory requirements and governmental awards and regulations. The Commission should be enlarged and so organized as to be able to deal promptly with the important railroad questions which under the existing scheme of Governmental regulation, must be considered by it. The position of a Commissioner should be placed beyond political influence by a long tenure of office, and the compensation should be sufficient to attract and retain men of the widest experience and greatest ability. The regulatory power of the Commission should be clearly extended to the supervision and control of all rates and practices which directly or remotely affect interstate transportation or commerce, and should include power to maintain a rate structure approved by or satisfactory to it, even though to accomplish this it should be necessary to prevent reductions of rates or to compel advances of rates found by the Commission to be unreasonably low. An unreasonably low rate may be beneficial to some one or more shippers, but the rates of some other shippers are sure to be disadvantageously affected thereby. The services of the Commission should be made available to remedy the concededly inadequate revenues of the railroads for the transportation of mails and Parcel Post, and the power of Commissions, State and Federal, to suspend increases in rates should be limited, so as to prevent loss of revenue to the railroads during the suspension of rates subsequently determined to be reasonable. Increases in wages and other burdens which seriously enlarge railroad expenses should not be imposed by legislation, or through awards of Governmental bodies, unless the ability of the railroads to pay the same under the rate schedules then in effect is clearly apparent, or unless the Interstate Commerce Commission is prepared to approve of increases in the rate schedules that will enable the railroads to meet the same without impairment of their credit or efficiency.

Weak railroads are among the greatest obstacles to business enterprise and commerce, and the country will have too many weak railroads unless a constructive and equitable policy of public regulation is practiced, not as a palliative, but as a permanent public and business necessity.

The railroads are still burdened with the needless expenditure required to comply with the so-called Full-Crew Laws, which are actually Extra Crew

Laws. The principal requirements of these laws, which vary somewhat in the different States, are in substance that every freight train of more than thirty cars must have a second brakeman in addition to the regular crew of engineer, fireman, conductor, one regular brakeman and a flagman; every passenger train having four or more coaches—this term covering Pullman and dining cars as well—and one baggage car, must have an extra brakeman in addition to the regular full crew consisting of engineer, fireman, conductor, baggage man and brakeman, this not to include train porters and Pullman employees; every train composed of four or more passenger, mail, or express cars, empty or loaded, must have a crew of engineer, fireman, conductor and two brakemen, even though no passengers are carried.

It is estimated that this law has added over \$1,000,000 per annum to the Operating Expenses of the Pennsylvania System East and West of Pittsburgh, and this enforced expenditure is a pure economic waste, because it does not increase the safety or efficiency of operations. This amount could have been spent to far greater advantage in the improvement of roadway and equipment, and in giving increased employment, from which the public and employees would have received real benefits. Arbitrary laws requiring additional men on trains without regard to the necessity for their services, impose a direct and unnecessary burden on the public and the Company. Such laws tend to weaken the working discipline, and from the standpoint of the employees not only impair the ability of the Company to continue to pay the present rates of wages to that great body of employees whose activities are needed, but also to delay promotion.

Your Company has, therefore, joined with other railroads in appealing to the public for their co-operation in securing the repeal of this unwise and wasteful legislation. The Management request the stock and bondholders and the employees, in their own interest, to support this movement.

#### TRAFFIC.

The tonnage decreased 12.83 per cent. and the tonnage mileage decreased 11.67 per cent., due to the general restriction of business, but freight train mileage was also reduced 13.87 per cent. The reduction in passenger business is reflected in the decrease of 2.30 per cent. in the number of passengers, 4.31 per cent. in passenger mileage, but passenger train mileage was also reduced 4.73 per cent. The net revenue per ton mile shows a slight increase, but the net revenue per passenger mile shows a large decrease.

#### CAPITAL STOCK AND FUNDED DEBT.

The capital stock was increased \$31,850, through the conversion of that amount of receipts issued under the stock allotment of 1913.

The Funded Debt and Equipment Trust obligations show a net decrease of \$7,080,879.35.

It will be recalled that at the last annual meeting the stockholders approved of the creation by the Board of Directors of a General Mortgage so that the Company might have a broad basis for future financing. This mortgage has not yet been recorded, and no bonds can be issued for any purpose thereunder without the prior consent of the stockholders, which has not so far been requested. The Company will refund \$86,827,000 of Convertible Bonds maturing October 1st, 1915, and other maturing obligations, and it must also provide for other necessary corporate purposes such as additions and betterments to its railroad and equipment. Since the close of the year it therefore sold \$49,000,000. Consolidated Mortgage 4½% Bonds, bearing date February 1st, 1915, realizing a price slightly in excess of par, a satisfactory result under existing conditions. Including the issue recently made, the total amount of bonds outstanding under the Consolidated Mortgage is almost \$100,000,000., which is the maximum amount that can at any one time be issued and outstanding. In view of the creation of the new General Mortgage, it is deemed advisable that hereafter the Consolidated Mortgage should be closed, and no further issues of bonds made thereunder.

This issue of Consolidated Mortgage Bonds was made under the authority conferred by the stockholders in March, 1909, when an increase of the bonded indebtedness was authorized to the aggregate amount of \$80,000,000. for the purpose of meeting the Company's requirements in 1909 and 1910. As such requirements were met through an issue of Capital Stock, only \$49,000,000. of the authorization then made has been utilized, so that the Company is still possessed of authority to increase the indebtedness to the extent of \$31,000,000. The latter amount will not be sufficient to meet the balance of the refunding and other requirements for 1915, as above stated, and the stockholders, pursuant to notice duly given, will at the forthcoming annual meeting be requested to consent to an increase of the indebtedness to the extent of \$40,000,000., so that with the pre-existing authorization the Company may be possessed of authority to increase its indebtedness to the extent of \$71,000,000., and the Board of Directors desire authority to make such increase through the issue of bonds secured either by the new General Mortgage or otherwise, or by the issue of other obligations of the Company in such form, at such times, and on such terms and conditions as shall be deemed to be most advantageous, but not in excess of \$71,000,000.

#### ROAD AND EQUIPMENT.

The following statement of improvement work carried on by your Company during the past year of unfavorable commercial and financial conditions is an evidence that, while every effort was made to enforce economies in the operations of your lines, because of the reduced volume of business, your Company, desiring to stimulate traffic, to encourage business activity and take advantage of lower prices, continued a fairly active improvement program throughout the year.

The work on the improvement of the passenger facilities in and around Philadelphia was continued. As a result, the five-track reinforced concrete and stone arch bridge of the Connecting Railway over the Schuylkill River at the Girard Avenue entrance to Fairmount Park has been completed and placed in operation and the old double track bridge removed; the work at North Philadelphia has been finished with the exception of remodeling the passenger station. For the expenditure made for this and other work along the Connecting Railway, your Company will be repaid through the issue of securities of the Connecting Railway Company.

The electrification of the Main Line from Broad Street Station, Philadelphia, to Paoli, is progressing rapidly, and without seriously interrupting the traffic. The work from Paoli to West Philadelphia is almost completed, including the sub-stations, and the remaining section of the electrification into Broad Street Station is being actively prosecuted. The new beam-light signals are in operation between Overbrook and Paoli. Satisfactory progress has also been made in equipping the steel cars, many of which are now in the present steam service, with electric motors and apparatus, for which these cars were originally designed. It is, therefore, expected to operate the main line suburban passenger trains by electricity about June 1st, 1915.

It is hoped that in 1915 financial conditions will permit the extension of electrification to North Philadelphia and the Chestnut Hill Branch, and also the elimination of certain grade crossings on that Branch. This would relieve the track and yard congestion at Broad Street Station, by transferring to the electric service over 60 trains on the daily schedule now operated by steam.

Your pier properties on the Delaware River south of Washington Avenue and at Walnut Street, Philadelphia, were improved during the year by the erection of new sheds and the enlargement of office facilities.

The reconstruction of the bridges at Earnest, Trenton Branch; over North

Broad Street at North Philadelphia; Highspire, Philadelphia Division; Auburn and Norristown, Schuylkill Division, and at Dornock Point, Pittsburgh Division, was completed during the year, and the bridges placed in service.

The masonry work for the double track steel bridge over the Allegheny River between Kiskiminetas Junction and Freeport has been completed, and the superstructure is being erected; the bridge at Phoenixville, Schuylkill Division, is being rebuilt, and will be completed in 1915.

On the new six-track section of the New York Division, between Colonia and Bay Way, just west of Elizabeth, N. J., work was continued during the year, consisting principally of the elevation of the four original running tracks. The greater part of this work has been completed, and placed in operation, and it is expected that the remaining portions will be finished in the Spring of 1915.

Considerable progress was made during the year in placing the telephone and telegraph wires underground, the section from Broad Street Station, Philadelphia, to Paoli, and from Jersey City to Rahway, having been completed. The purpose of this work is to prevent delays in train movements and in the transaction of the Company's business by reason of the destruction of overhead wires by sleet and other storms, and also to avoid interference by electric transmission lines, and other wires.

During the year the final link in the automatic block signal system on your Main Line between New York and Pittsburgh was completed. The installation of this modern signal system will add to the safety of operations and materially aid in expediting train movements.

New freight stations were placed under construction at Harrisburg and Allegheny, which will be completed in 1915. The passenger and freight facilities at Elizabethtown, Altoona and Brookville are also being enlarged to handle an increased traffic.

The Sugar Camp Branch, Tyrone Division, the Shade Creek Branch, Pittsburgh Division, and the Homer & Cherry Tree Branch, Conemaugh Division, were extended to reach new coal openings; the Yukon Branch extension from Bells Mills to Cowansburg, Pittsburgh Division, was completed, and a branch is being constructed from Gilberton to Mahanoy Plane, Schuylkill Division, to develop additional coal traffic.

Work was continued on the elimination of grade crossings at Homewood Avenue, Pittsburgh, and in the Borough of Wilkensburg, Pittsburgh, at which latter point a new passenger station is being constructed. It is expected that this work will be completed in 1915.

The elimination of grade crossings, change of grade and the erection of a new passenger station in the City of Johnstown is proceeding, but will not be completed before 1916.

The change of line and grade on the Renovo Division at Cameron and Horn, and the construction of a second track between Corry and Lovell, have been completed.

Surveys and many of the plans have been completed for the new line and the elimination of grade crossings in South Philadelphia; to be carried out jointly by your Company, the Philadelphia, Baltimore & Washington Railroad Company, the Baltimore & Ohio Railroad Company, and the City of Philadelphia.

Further consideration was given to plans for the future electrification of your main line crossing the Allegheny Mountains, from Altoona, the foot of the eastern slope, to Coraue, on the western slope, by which it is believed large operating economies can be effected, and the heavy passenger and freight train movements facilitated.

The aggregate expenditure for Construction and Equipment upon the owned and leased lines was \$14,485,898.55, of which \$8,076,086.80 was charged to Capital Account and the balance to Income, Profit and Loss and the Reserve for Additions and Betterments.

#### ROAD AND EQUIPMENT—AFFILIATED COMPANIES.

The construction of the New York Connecting Railroad was continued. The foundations and masonry of the East River four-track arch bridge have been completed to the track level, and the erection of the steel arch over that river is proceeding. Its viaducts and approaches on Long Island and on Ward's and Randall's Islands are also substantially completed, and favorable progress has been made on the remaining sections of the line. The funds for these expenditures were provided by the sale of the New York Connecting Railroad Company's First Mortgage 4½ per cent. bonds guaranteed by your Company and the New York, New Haven & Hartford Railroad Company, owners of all the stock of that Company.

The erection of the double track steel bridge over the Delaware River south of Trenton, is proceeding. This bridge is part of the proposed New York Division double-track relief line known as the Pennsylvania & Newark Railroad, which will extend from the Yard at Morrisville, Pa., to Colonia, N. J., a distance of about 40 miles, there connecting with the six-track system on that Division, and will also have branches connecting with the Trenton and New York Divisions near Trenton, N. J.

The revision of the grades and alignment and the construction of additional tracks and passing sidings on the Western New York & Pennsylvania Railway between Oil City and Buffalo, via Chautauqua, was continued during the year, and will shortly be completed. This work in connection with the improvements on the Allegheny Division, will, when fully completed, furnish a route on lower grades and with improved alignment between Pittsburgh and Buffalo, over 58 miles shorter than the present route via Salamanca Branch and Olean.

#### COAL COMPANIES' SECURITIES.

The properties of the various anthracite Coal Companies served by your lines, in the securities of which your Company and the Northern Central Railway Company were interested, were purchased by the Susquehanna Coal Company, and a complete examination of the coal lands, collieries, plants and facilities of the latter Company and their operating results, is being made by an experienced mining engineer and by certified public accountants, so that your Company will have the benefit of this independent survey and report of the properties to assist in determining the proper price that should be received for the securities of the Susquehanna Coal Company in the event of a purchaser being found therefor.

#### SECURITIES OWNED.

Your Company received as its pro rata share of the stock dividend of 40 per cent. of the Northern Central Railway Company, \$4,230,880. at par, of the Capital Stock of that Company. This stock issue was approved by the Public Service Commissions of Maryland and Pennsylvania, and represents part of the cost of capital expenditures made in previous years for additions and betterments to its railroad and equipment.

Cleveland & Pittsburgh Railroad Company Special Guaranteed Betterment Stock amounting at par to \$3,729,100, was sold, and additional Norfolk and Western Railway Company Common and Preferred Stock, amounting at par to \$1,800,000. and \$1,726,000. of Susquehanna Coal Company Bonds were purchased from the Northern Central Railway Company.

By order of the Board,

SAMUEL REA,  
President.

STOCKHOLDERS MAY OBTAIN COPIES OF THE ANNUAL REPORT COMPLETE, BY APPLYING TO OR ADDRESSING  
LEWIS NEILSON, SECRETARY,  
BROAD STREET STATION, PHILADELPHIA, PA.